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JUNE 1944

MECCANO

MAGAZINE



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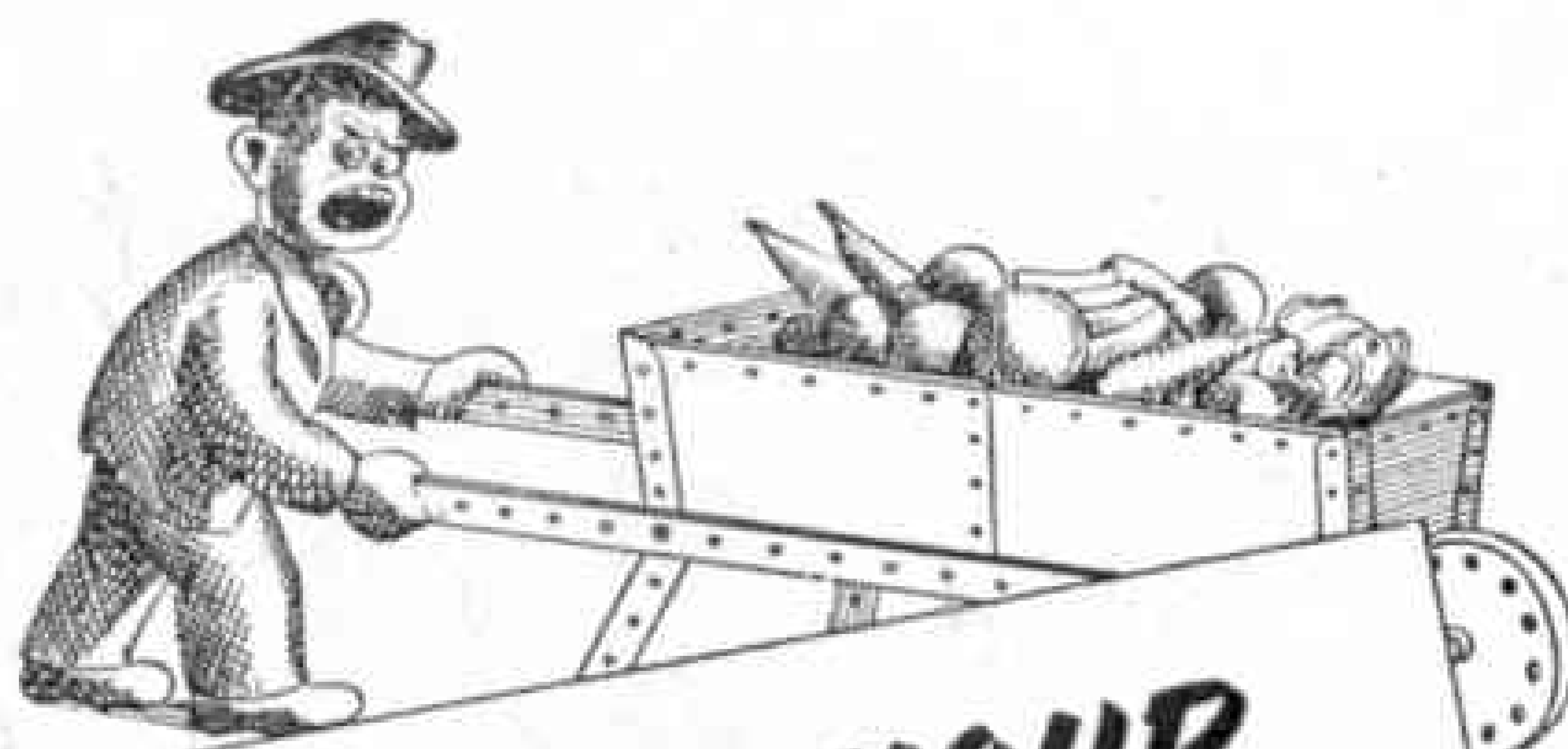
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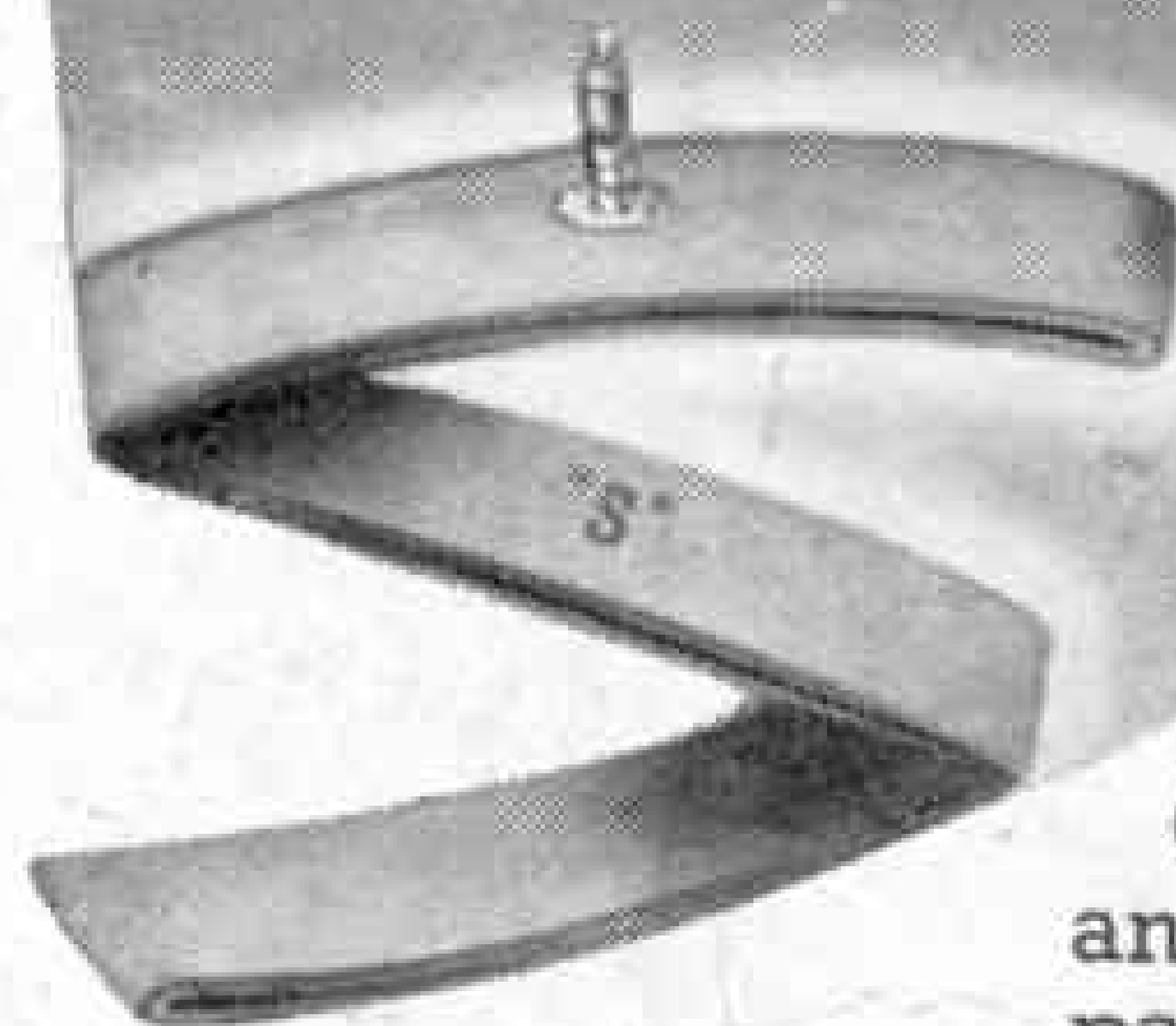
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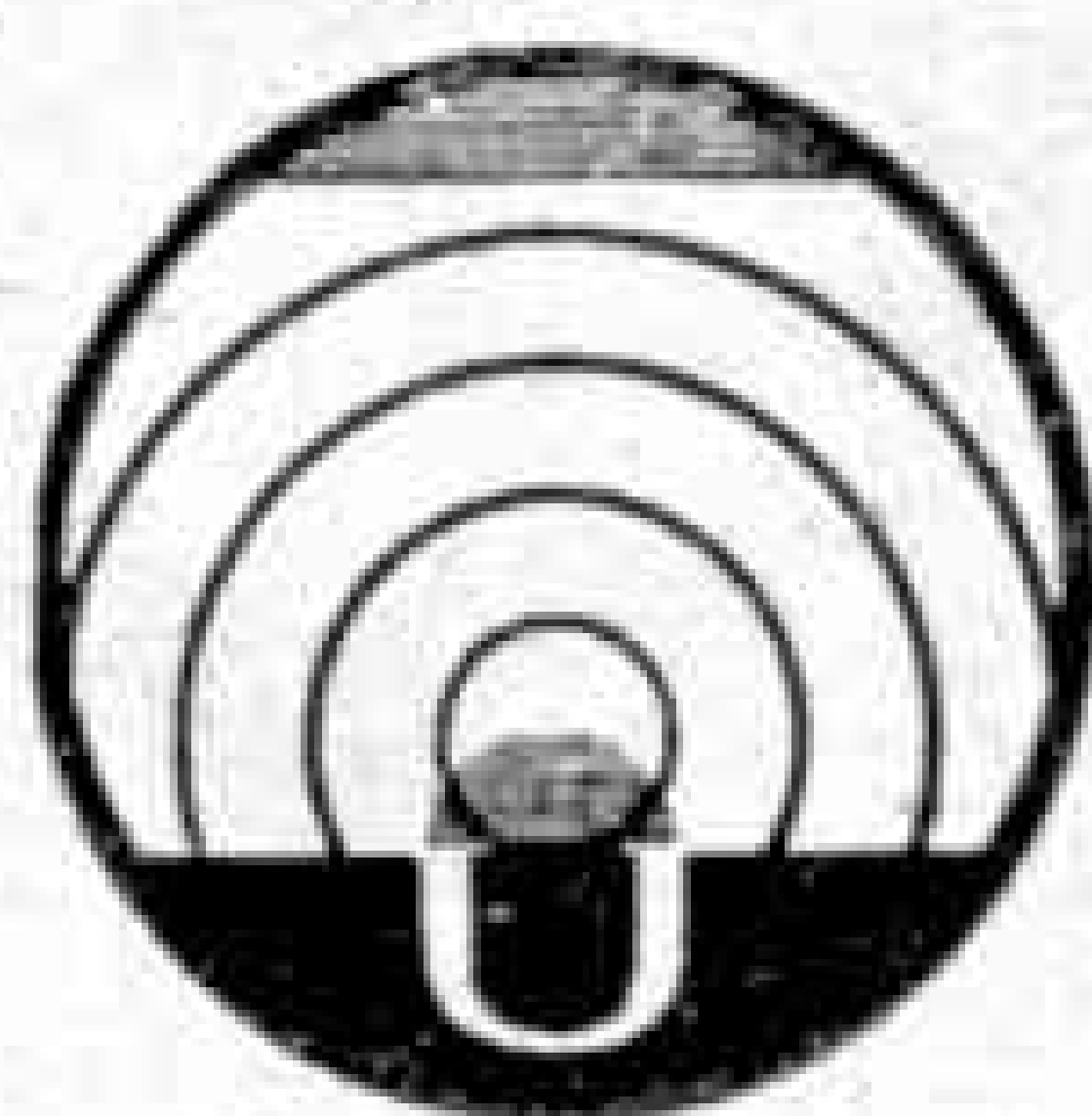
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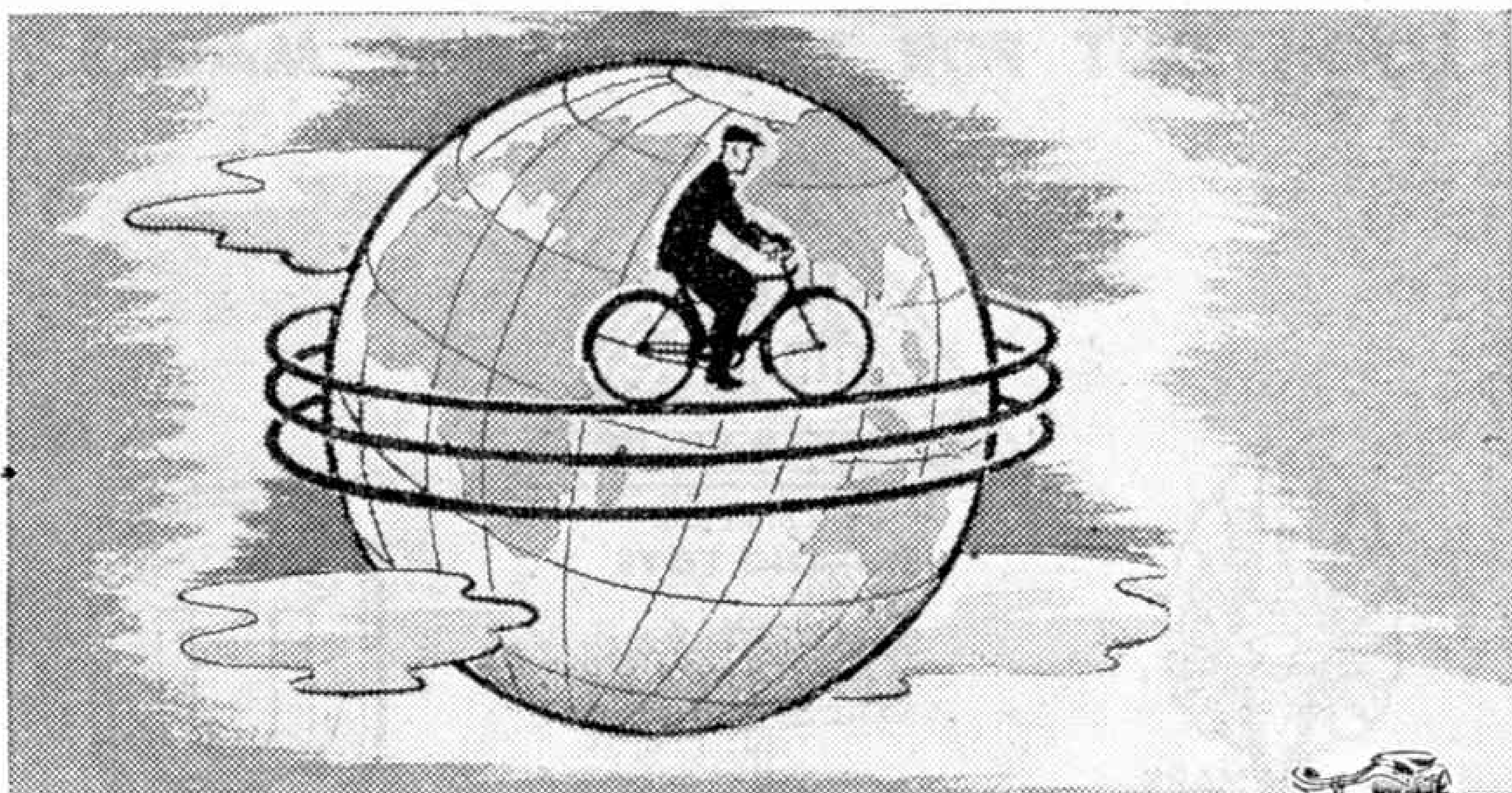
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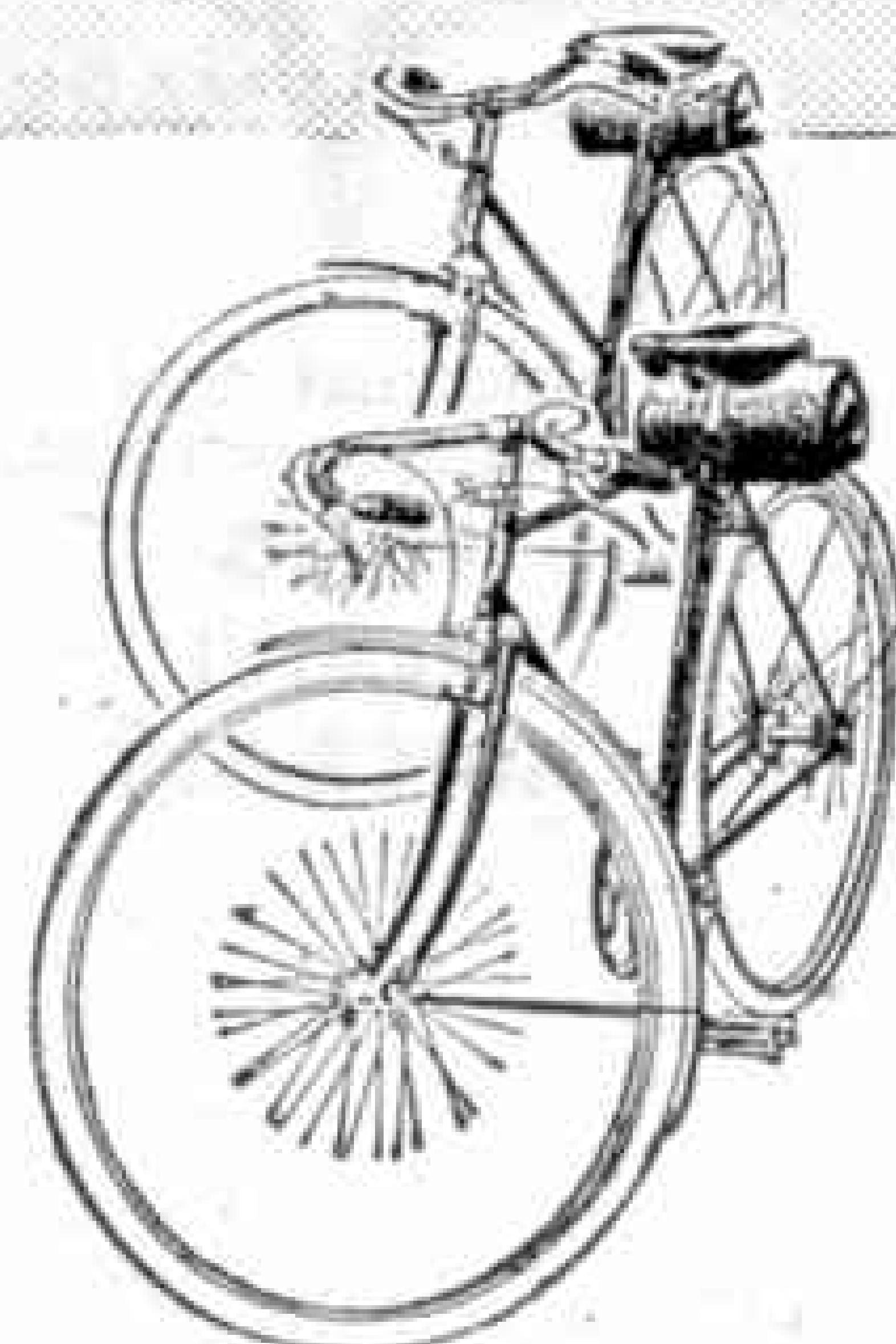
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MECCANO

MAGAZINE

Editorial Office
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Vol. XXIX
No. 6
June 1944

With the Editor

Railway Speed and Comfort

The article on page 188 of this issue dealing with streamlined locomotives and trains prompts a few thoughts on the improved riding comfort of the railway services that were becoming so popular before the war. In this country the trains for the high-speed limited-load services to Scotland, Newcastle and the West Riding were developed for the special needs of this traffic. But the more standard vehicles too, that were used for old friends such as "*The Flying Scotsman*" and "*The Royal Scot*," had been greatly improved even as compared with their predecessors of a few years before, while the advance from the trains of our grandparents' time was simply tremendous.

I realised very forcibly the difference between the riding comfort of the trains of years ago and those of modern times, in 1938, when the L.N.E.R. assembled a typical "East Coast" train of 1888 to enable comparisons to be made between it and the new vehicles provided for "*The Flying Scotsman*" of 50 years later. I count myself fortunate to have been among the party who made a journey down the old Great Northern main line from King's Cross, part of the way in the 1888 train and the rest in the 1938 train. Rather hard, unsympathetic riding was the keynote of the austere-looking old six-wheelers. While not uncomfortable, this was in striking contrast to the rhythmic and smooth progression of the modern bogie coaches, quite apart from the furnishing and general amenities of the new train.

If the coaches have improved from the "good old days," so too have the locomotives. Greater comfort and facilities, better riding, and so on, all spell increased weight, and with the speeding-up process that was general before the war the task

of the modern locomotive was undoubtedly getting harder. Just how the engines that we know, with all the advantages of increased boiler pressure, superheated steam and up-to-date front end design, can rise to the occasion, has often been described in the "*M.M.*"

I think my greatest thrill was on the occasion of a special trip in 1937 on "*The Coronation Scot*" of the L.M.S., just before this went into regular service. With the master hand of my friend Tom Clarke at the regulator of No. 6220 "*Coronation*," we whipped up from 85 m.p.h. to a maximum of 114 m.p.h. in less than eight miles! There was something uncanny about the way in which lineside objects were passed, faster and faster; yet all the time with smoothness and a sense of absolute safety—the keynote of British railway operation.

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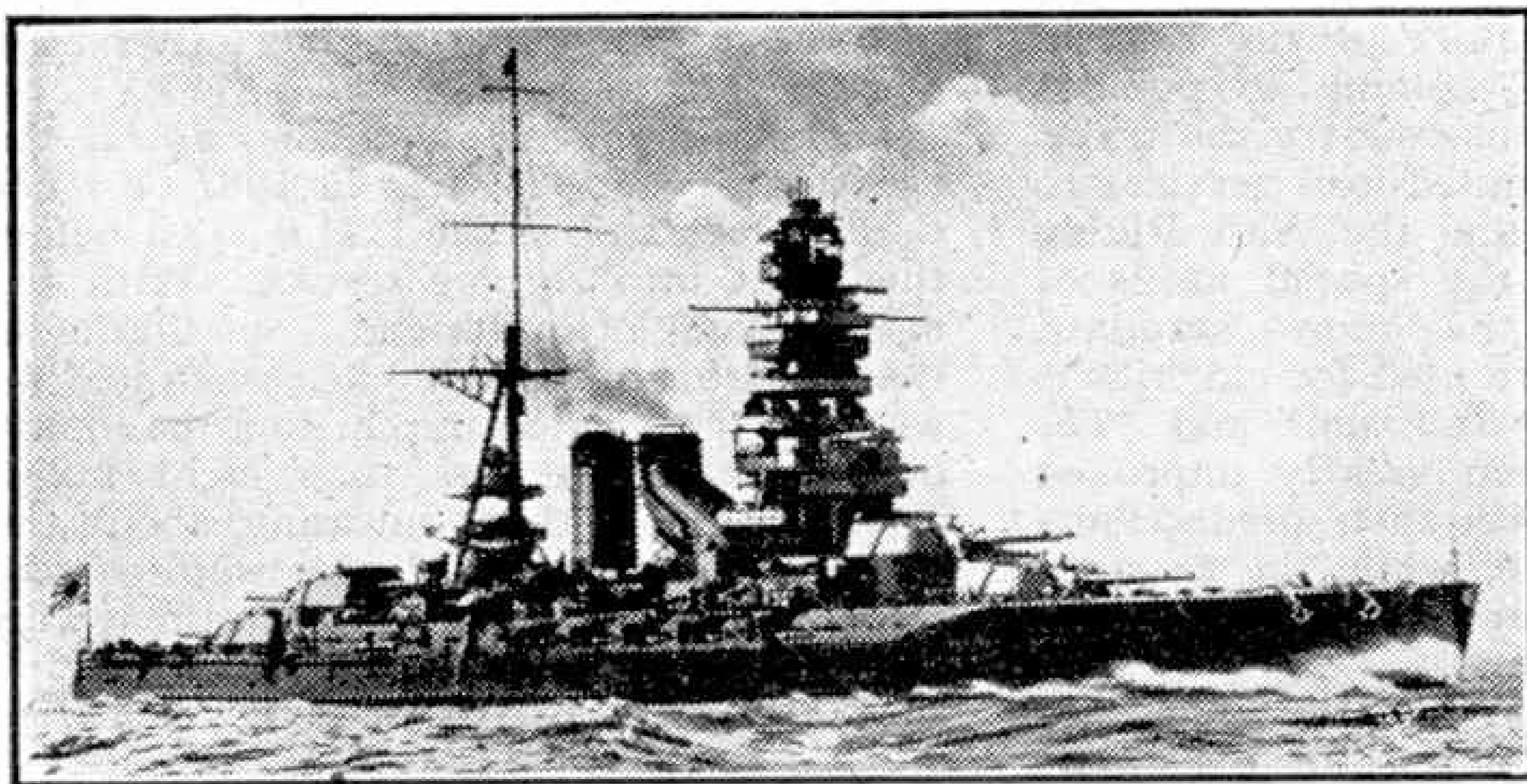
How to Beat Japan

A Sea Affair, says Capt. B. Acworth, D.S.O., R.N. (Retd.)

AS the weeks pass and the war in Europe moves to its crisis, there is a tendency to let our other war against Japan slip into the background of our minds. Japan is 10,000 miles away, whereas the Germans are only 21 miles across the English Channel. What is so far out of sight is apt to be out of mind, but no profounder mistake could be made than to think that when we have settled with Hitler, the overthrow of Japan will

a few weeks of the treacherous attack on Pearl Harbour, had seized every territory within a radius of 3,000 miles, or more, of the Island Kingdom itself. With this territory she secured the great Naval bases of Singapore, Surabaya, Hong-Kong, and Manila, as well as the vast archipelagoes of Oceania. Since her almost fabulous conquests Japan has, we may be sure, strengthened the great captured bases to a point beyond their great strength at

the time of their capture. Furthermore, her conquests provide her with every requirement for war with the possible exception of iron and cotton. If to these assets we add the vast expanses of the Pacific Ocean and Bay of Bengal, which separate her from her opponents; her great conquests of the China mainland, and the im-



The 32,700-ton Japanese battleship "Nagato." Note the enormous foremast structure.

be relatively easy. In some respects the far-away island Power of the Rising Sun is a harder nut to crack than is the land-might of our formidable European enemies.

Before outlining the great combined operations that will be needed to cause the Rising Sun of Japan to set, it may be well to consider briefly the main features of the problem to be tackled. First let us consider Japan's sources of strength in the moral, strategical and military spheres.

The Japanese, as we know, are fanatically brave, looking upon death in action as the highest honour. This "fanaticism" is derived from their conviction that they are children of "the Gods." We should not underestimate this source of spiritual fervour as a fighting asset when we remember the contempt of death shown by Christians who recognise themselves as children of God with Eternity before them.

In the strategical sphere Japan, within

penetrable curtain of silence behind which Japan can plot and plan, it is not an exaggeration to say that, except in one respect, she holds the strongest strategical position ever achieved by a single Power in history.

In the military sphere Japan has an army that can be reckoned in millions, a large part of which is highly trained and as experienced in war as any army in the world. Her air force, though smaller and less skilled than the American in the far-away islands of the Pacific, is likely to be formidable in key theatres. Remember the "Prince of Wales" and the "Repulse," and the "Dorsetshire" in the Bay of Bengal.

But it is upon the Japanese Navy that the enemy's strength ultimately rests, and here there can be little more than guesswork because since 1936 complete secrecy has surrounded Japanese naval construction. At that time Japan had nine



The seas and islands where the Japanese will have to be met and defeated.

powerful battleships, about 35 cruisers, about 150 destroyers, five or six aircraft carriers, and an armada of submarines, many of great power and sea-endurance.

It is therefore clear that morally, strategically, and militarily, we have an enemy formidably equipped against unconditional surrender.

Is there then no source of weakness in Japan's position you may reasonably ask? Happily there is. The immense sea distances that separate her from the Allied Forces also separate her from her own garrisons of the great strategic bases she has conquered, and which she must hold if her newly acquired Empire is not to collapse like a house of cards. This implies a Navy and Merchant Marine powerful enough to defeat, or neutralise, the potentially far greater combined sea-power of Britain and America. Thus sea-power, up to the present Japan's source of strength, must be converted into her Achilles heel.

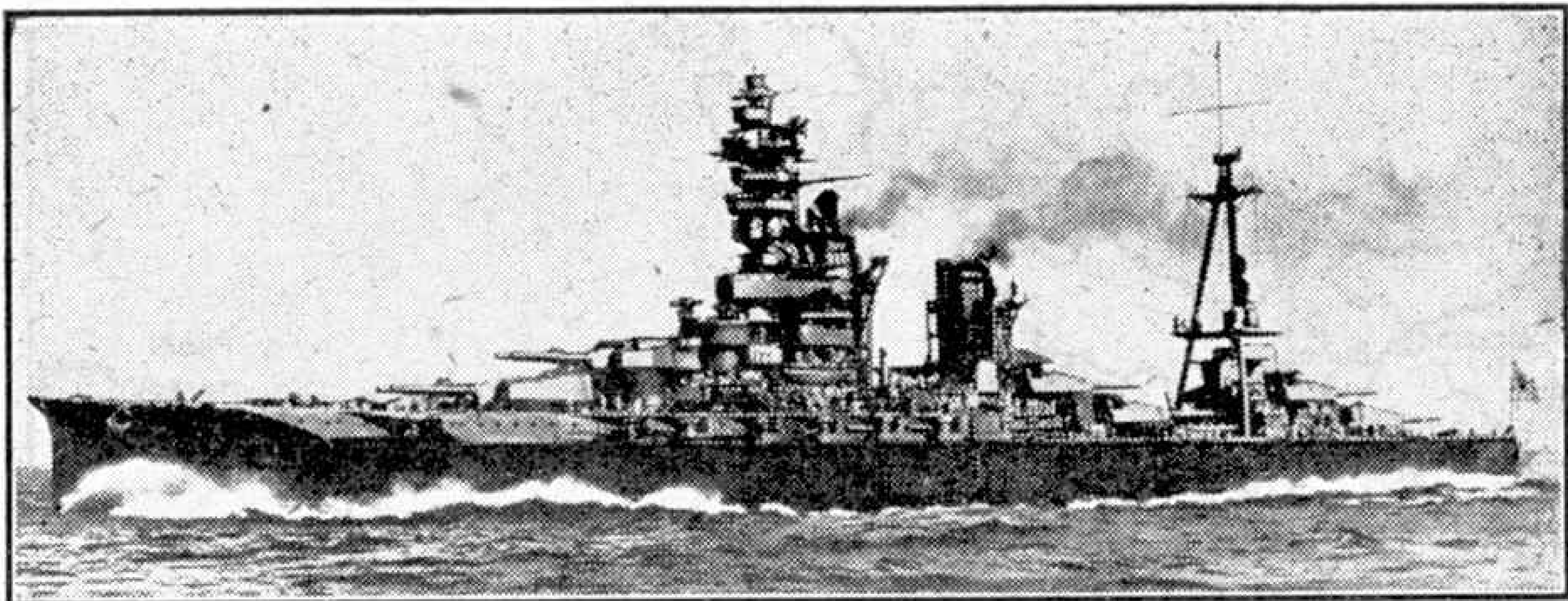
So much for Japan's vast sources of strength and her one source of weakness. What of Britain and America when together they set about Japan in earnest?

Let us, as in the case of Japan, consider the Allied position in the moral, strategical and military spheres. Morally we may be sure that the fighting men of Britain and America are at least the equal of their enemies. In skill they probably are their superior. We must remember, however, that the civil populations of the Allies are far from the scene of action, and after years of exhausting war in the West are liable to war weariness to a greater extent than are the Japanese who are directly

threatened by an Allied offensive. Assuming, however, as we may, that Anglo-American determination will remain unaffected by distance or war-weariness, in the moral sphere we are equal to the Japanese.

Strategically, on the other hand, the strength of the Japanese position is a measure of our weakness. In a word, we lack those great naval bases with which the enemy is so richly endowed. Our nearest base, and that is not a large one, is at Trincomalee in Ceylon, 1,500 miles from Singapore, and over 3,000 from Japan. America's nearest base is Pearl Harbour, 3,400 miles from Japan. Australian bases are still further afield, and are useful mainly for the island warfare which, up to the present, has been the limit of operations. In the military sphere the British and American forces and material, on the sea, in the air, and on land, are *potentially* greater than those of Japan, but, as I have shown, they are separated by vast stretches of ocean. The problem, therefore, is to bring our potential military superiority into action. This is essentially a Naval problem, and the remainder of this article will be devoted to the Naval developments to be expected in what may well prove to be the greatest Naval war in history.

As already pointed out, Allied action has so far been confined to winning back Japan's far-flung island "strong-points" in the S.W. Pacific. Many of these are now isolated by American sea and air power, but strong Japanese garrisons still hold them. To obtain them for Allied use will necessitate the landing, and sustaining,



The battleship "Mutu," carrying eight 16 in. guns, twenty 5.5 in. guns and eight 5 in. A.A. guns.

of stronger Allied land forces. This necessitates the employment of great Naval and merchant ship forces which are thus unavailable for the grand offensive where alone it can be decisive—in the China Seas. Indeed, Japan is using her garrisoned islands in Oceania as a means of dividing the potentially greater Allied sea-power. Her main fleets, upon which Japan's strength pivots, will not be brought to action near these far-away "atolls." Japan's sea-communications with Malaya, Burma, and the Dutch East Indies are her "life-line." It is this life-line we have to sever, and it is in the China Sea where Japan must face her "Trafalgar." How can this decisive battle be provoked and won?

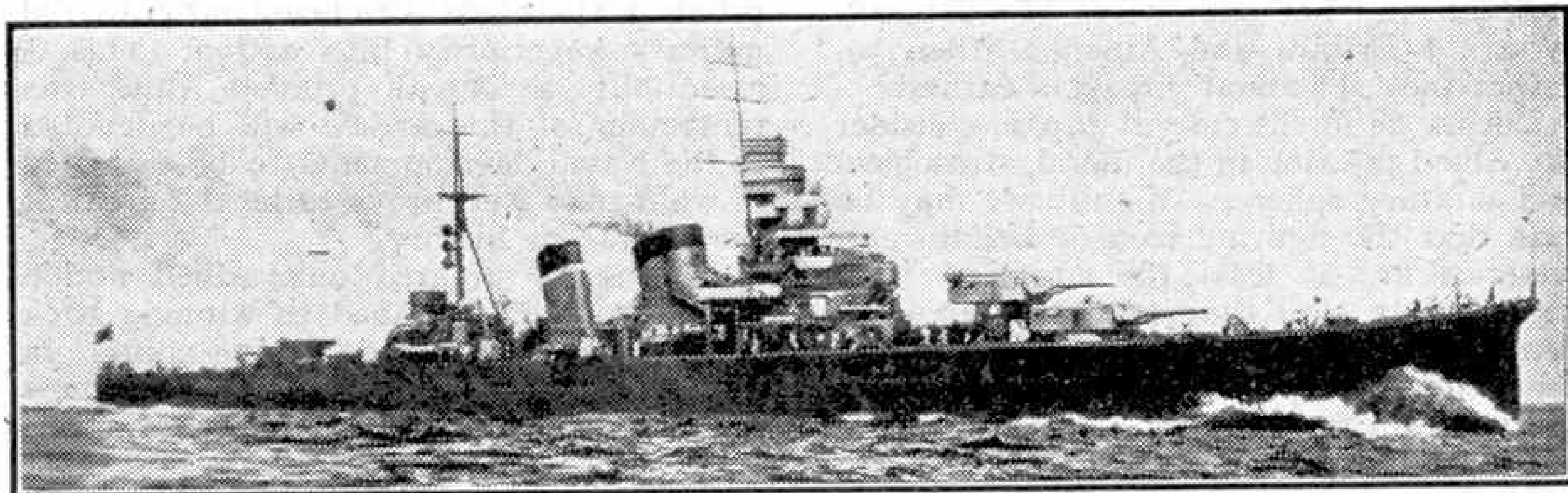
Though the strength of Japan's fleet is not known, we can be sure of being able to muster a more powerful combined fleet at Hawaii, or in Ceylon and India. But that, in itself, is not enough. It must have a great base nearer Japan's vital China Sea communications. Otherwise this Allied armada, after steaming thousands of miles to engage the enemy fleet, will have to return to its bases if, as will almost certainly be the case, the Japanese decline a major fleet action. No. In order to bring Japan to action we shall have to establish ourselves securely on, or near, her main communications. This, as I see it, necessitates the recapture of Singapore or Manila as the first decisive step. And as Manila is 3,000 miles from Pearl Harbour, or 6,000 miles for the return voyage, the recapture of Singapore seems to be the key to effective Allied action.

But Singapore, we may be sure, is now most powerfully defended, not only from the sea, from which it must be almost impregnable, but from Malaya. We have, therefore, to face a mighty amphibious operation across the Bay of Bengal, which makes the establishment of a Second Front in Europe seem almost simple by comparison. The most

promising scene of assault is probably Rangoon, which is 1,000 miles on the wrong side of Singapore for the Japanese, and only 700 miles from Calcutta, and 1,200 from Ceylon, from the Allied point of view. Firmly established at Rangoon, we should be on our way to re-open the Burma Road; to reconquer Malaya and Singapore by land, and to threaten Indo-China and Siam.

But we may be sure that great Japanese armies are assembled to resist invasion of Burma or Malaya. In the Bay of Bengal the invading armada, escorted by a great Allied fleet, would be subjected to concentrated attack by submarines based on the Andaman Islands, and by fleets of shore-based torpedo-aircraft. The Allied invasion can hardly have the advantage of surprise, because the points of invasion are limited. Furthermore, for half the year the Monsoon would make a great amphibious operation impossible.

It will be seen, therefore, that the initial offensive against Japan is of the nature of the launching of the Second Front in Europe, with many obstacles superimposed. When, however, this has been successfully achieved, and, let us assume, Singapore is once again in our hands, the rest is comparatively plain-sailing. With a great Allied fleet based on Singapore, all Japanese vital sea communications are under threat. Japan herself would become subject to blockade under the pressure of which her fleet would be forced to try conclusions with the more powerful Allied fleet. In such a trial of strength there could be only one conclusion. With the Japanese fleet sunk, or routed, Japan would ultimately be forced by blockade into unconditional surrender without the necessity of invasion. In this respect Japan is more vulnerable than is England. A thickly populated island is only strong so long as her sea-communications are secure. Once these have gone, (Continued on page 214)



The 8 in. gun cruiser "Kako," speed 33 knots.

The Story of Steel

1. What is this Wonderful Metal?

By Eric N. Simons

THE whole world is full of steel; civilisation depends upon this wonderful substance.

What then is steel? Metal, of course; but what is metal? Break an old worn-out pocket knife blade, and examine the broken edges through a magnifying glass. You will see a number of glinting specks, bright, white and staring. These are the crystals of which steel is composed; for steel, strange as it may seem, is as crystalline as snow. Steel makers nowadays generally refer to these crystals as grains.

Actually steel is iron with a difference; and that difference is the amount of carbon it contains and the form in which the carbon is present. A clever reader will prick up his ears and say: "Yes, but there is carbon in cast iron, lots of it. Why is steel different from cast iron? Why does the form in which the carbon is present matter?"

Here are the facts. For steel to be steel, and not iron or cast iron, it must contain less than 2.2 per cent. of carbon. If it has more it is cast iron, and the carbon will be there in a different way. But at the same time it must have some carbon. If it has no carbon at all, or virtually none, it is wrought iron, not steel.

In practice steel seldom contains more than 1.5 per cent. of carbon; and the effect of this carbon is to make the steel much harder than wrought iron and much stronger.

Now let us consider the actual form in which the carbon is present. In cast iron, as the clever reader has pointed out, there is a good deal of carbon. This is present, however, in what we call a "free" or separate form, and it is closely akin in nature to the carbon of the lead in the pencil; in fact it is called graphite. If carbon were present, as it might be, in this graphitic form in steel, the steel would be useless as steel.

Steel must contain carbon united with iron in the form of iron carbide, which is known as a chemical compound. It is essential to understand what a chemical compound is, and an interesting experiment will help. For this you need a little

powdered sulphur, or brimstone, and a few iron filings. If you mix these together nothing exciting happens, and even after stirring them well, or shaking the mixture for a long time in a dry bottle, you will still be able to see the yellow particles of sulphur and the dark iron filings, especially if you use a magnifying glass. By means of a magnet you can pick out the filings, leaving the sulphur behind.

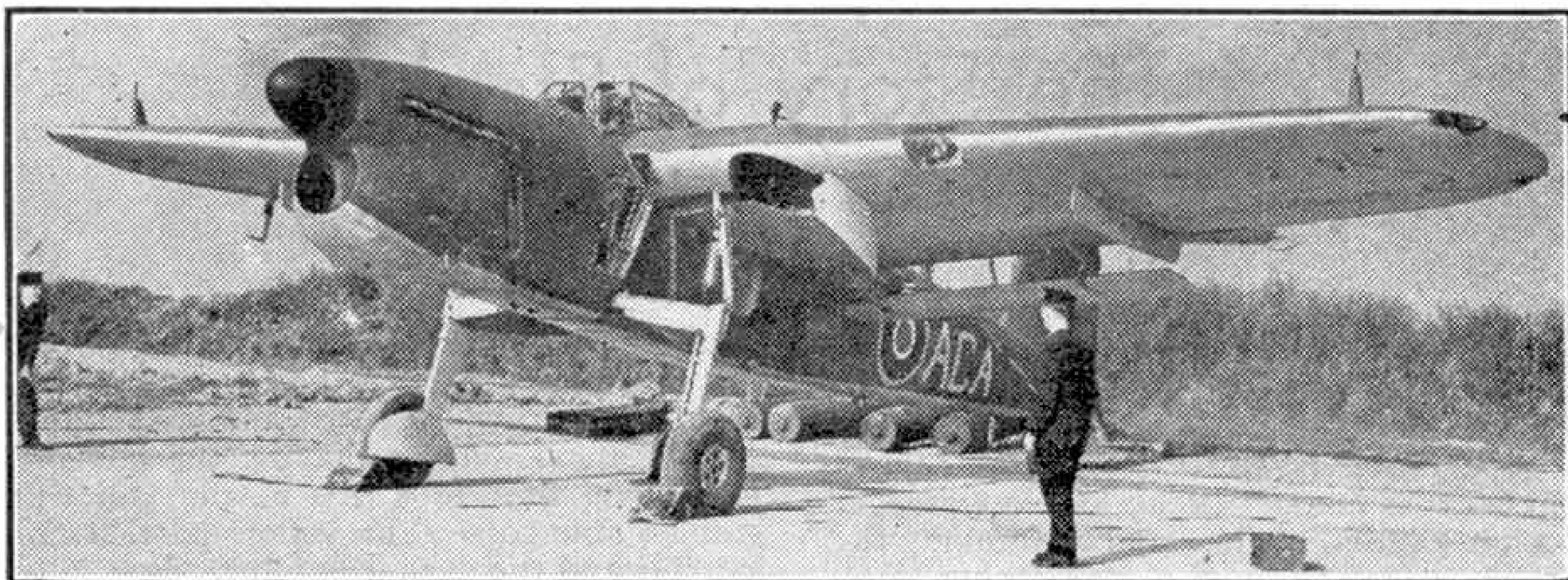
So far the sulphur and the iron have not been changed; all that has been made is a mixture of the two. But now put some of the mixture in a stout tin lid and heat it on the gas cooker, or even over the fire. Something remarkable happens at once. Part of the sulphur burns away with a blue flame, and the remaining mass becomes red hot. On examination after cooling it will be found that the tin lid no longer contains sulphur and iron filings mixed together. Instead you have a black substance in which the magnifying glass reveals neither yellow particles of the one nor dark bits of the other, while a magnet is no longer effective in separating the two. The result of heating has been to form an entirely new substance by the union of the iron and the sulphur. This new substance is iron sulphide, which resembles neither of its constituents in any way.

When a third and entirely different substance of this kind is formed by the union of two substances, it is termed a chemical compound. We have thus to distinguish carefully between a mechanical mixture and a chemical compound. Iron carbide is an example of a chemical compound, and it is in this form that the carbon is present in steel.

Carbon by itself, whether as charcoal or graphite, is soft, brittle and easily powdered; iron by itself is soft, easily shaped by hammering, and readily drawn out. The chemical compound carbide of iron, on the other hand, is extremely hard, less easily powdered, and altogether different from either of its parents.

Steel is actually an alloy of iron and iron carbide. Next month we shall see how this remarkable metal is produced.

(To be continued)



Photograph "The Aeroplane" copyright.

The Fairey "Barracuda"

By John W. R. Taylor

"WHAT an odd-looking aeroplane." That is the natural reaction on seeing the Fairey "Barracuda" for the first time. Test pilots, however, say that it is a delightful aeroplane to fly, and it is well suited to its exacting duties. Designed to a very rigid specification, which demanded a monoplane capable of carrying a torpedo, bombs, or mines, it had to conform with strict maximum size requirements, and be operable by night or day from land bases or aircraft carriers. These requirements were additional to those governing every aircraft design—ease of production and maintenance, high performance, and good controllability; as well as the peculiar requirements of a torpedo-bomber, that it must be able to fly at an exact speed, on a straight and level course, in any weather, to launch its torpedo, and then leave the scene of action quickly enough to escape being blasted to pieces by point-blank gunfire.

Each of these requirements has left its mark on the design of the "Barracuda." Its "Merlin" 32 engine, which develops nearly twice the power of the "Merlin" fitted to the "Hurricane" in the Battle of Britain, gives it exceptional performance at sea level. The high wing arrangement was adopted to give the pilot a good view forward and downward during an attack and for landing, and "bay windows" under the wings give the navigator excellent all-round vision.

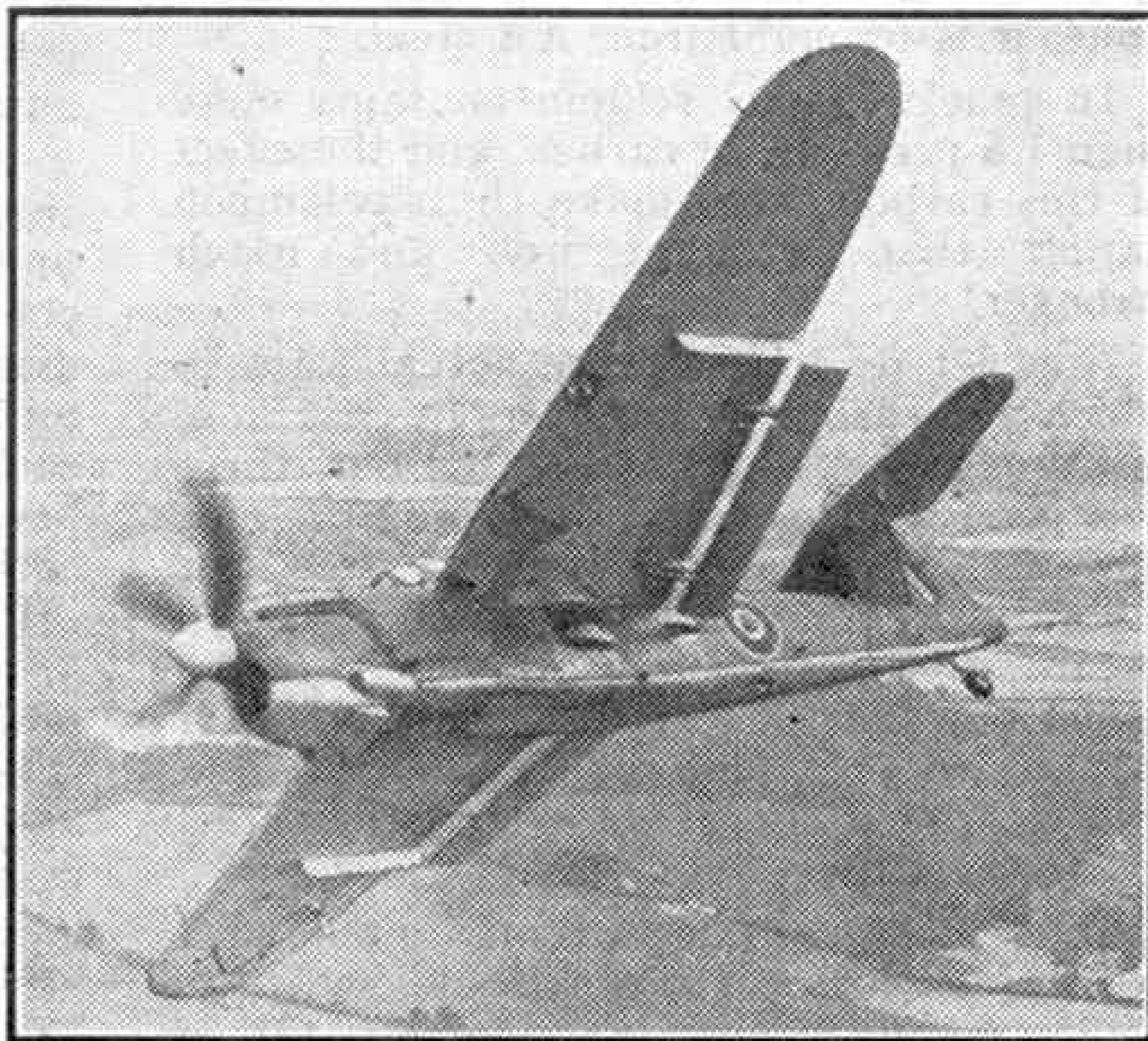
This high wing would have necessitated a stalky undercarriage had a cantilever unit been used. Instead the Fairey company evolved the sturdy L-shaped unit that can be seen in the upper illustration on this page. The two arms of each "L" remain at right angles to each other during retraction, and are housed in the fuselage side and the wing.

The large wing flaps that give the "Barracuda" almost a biplane appearance are used not only to increase "lift" for take-off and slow down the aircraft for landing, but, inclined at a negative angle, they can be used as dive-brakes during dive-bombing attacks. When used in this manner it was found that the airflow over the flaps was disturbed and so had a bad influence on elevator control. Consequently the tailplane and elevators have been mounted high up the fin, like those of the "Whirlwind," out of the way of the disturbed air.

All aircraft designed for the Fleet Air Arm must have folding wings to facilitate stowage aboard carrier, and those of the "Barracuda"

fold in a most ingenious way. First of all the trailing edges, complete with flaps, fold upward to lie upside down on the upper surface of the wings, then the wings swing back on each side of the fuselage. An arrester hook for deck landing is fitted.

The "Barracuda" has a great tradition to live up to. Fleet Air Arm torpedo-bombers have disposed of well over half a million tons of Axis shipping since the war started. There is every reason to believe that it will carry on the good work. Its first big job—the bombing of the battleship "Tirpitz" on 3rd April—has got it off to a fine start. In a gallant attack, pressed forward with great determination, "Barracuda" pilots seriously damaged Germany's only seaworthy battleship. The German Navy has thus had a foretaste of the "Barracuda's" power. From now on, everywhere the Royal Navy sails, "Barracudas" will be there to put into practice the Fleet Air Arm's motto—Find, Fix and Strike.



This excellent flying view shows well the large wing flaps and the position of the tailplane and elevators high up the fin.
Photograph "The Aeroplane" copyright.

Life-boat Service in Wartime

WHENEVER we think of the life-boat service we imagine the crews of the vessels putting out to rescue shipwrecked sailors. This is superb work, but the service has many things to do besides this, and the many examples of the versatility of the life-boat given in this book* will be a revelation to most of its readers. Even in peace there are many urgent tasks to be done around the coasts of the British Isles at times when it is too rough for ordinary boats. In wartime matters of urgency of this kind are even more frequent, and life-boats have been sentinels to stand by mines to warn shipping, fire engines attacking blazes on steamers that have been bombed, and landing boats for mock invasion parties. In the words of the book: "They have taken food to the starving, the doctor to the injured, the priest to the dying," carrying all manner of people in rough seas, from a mines disposal officer going out to blow up a mine, to wounded men being rushed to hospital.

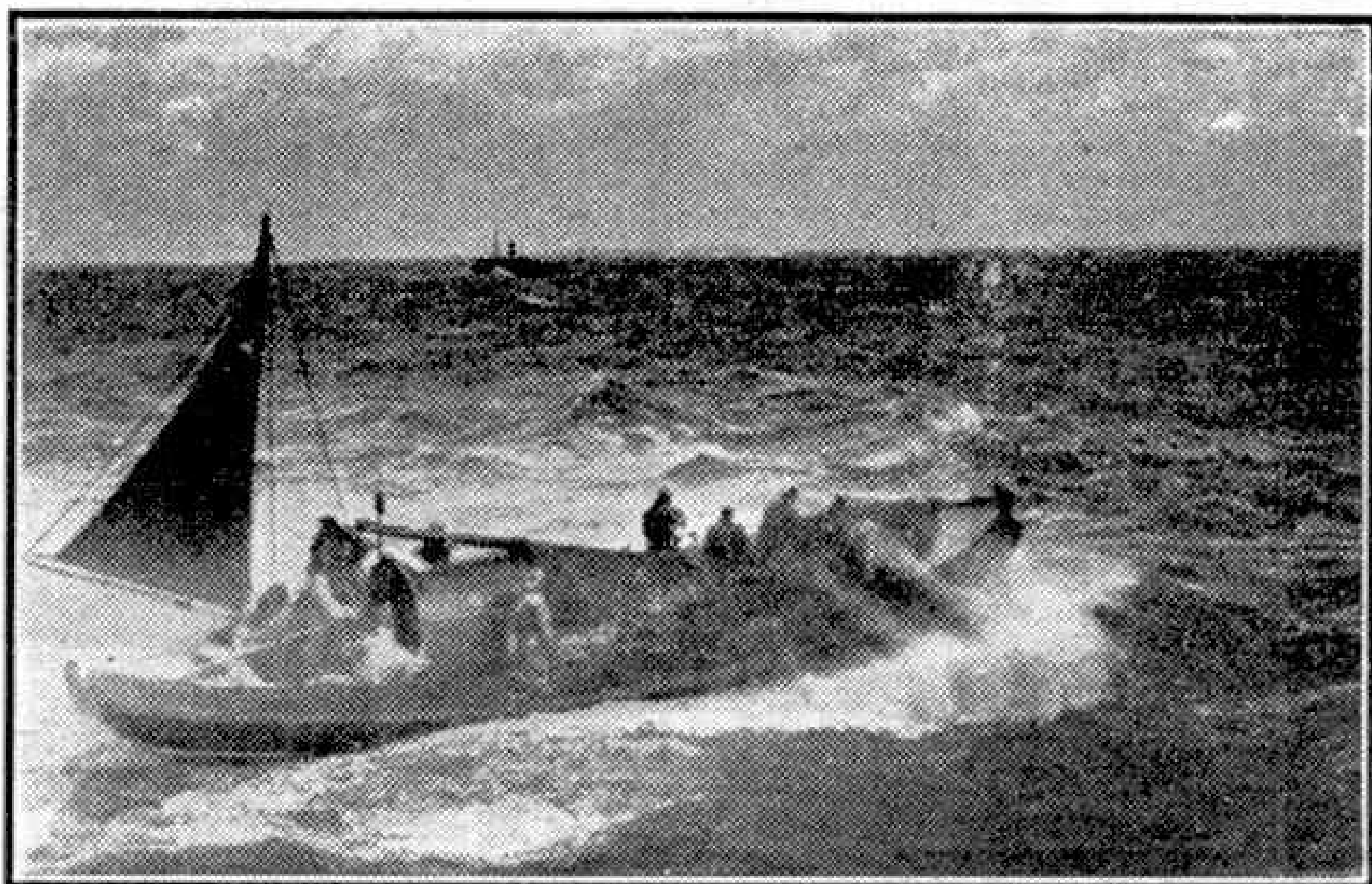
Many stories in the book illustrate the immensity and variety of the tasks that the life-boats and their crews have been set in the 4½ years since the war broke out. One of the finest examples is that of the Fraserburgh boat during the third winter of the war, when heavy snow storms in the north of Scotland had blocked roads and railways and brought down telegraph and telephone wires. The sea was still open, however, and in turn the Fraserburgh life-boat took food to a village along the coast, brought electricians to Fraserburgh itself to repair the electricity plant, carried more food to the starving village, and the day after again visited it to give urgent news. Then the vessel once more became a life-boat, going out in darkness, with snow still falling, to the help of a Grimsby trawler; later she took a doctor to another village where his help was urgently needed. All this within six days.

Blinding snow has been the accompaniment to many life-boat services in the war. It was in heavy snow showers that the crew of the Humber life-boat rescued the crew of one of H.M. trawlers in the fourth war winter. The trawler had struck on the sands and was smothered by heavy seas, with a six-knot tide swirling fiercely round her. The tide indeed was so strong that it took command of the life-boat, so that the coxswain could not hold her alongside, or prevent her from being flung against the trawler. Twelve times he brought his boat in close, holding her there for a few seconds while one or two of the trawler's crew jumped, to be dragged aboard. The life-boat's mast was snapped, her wireless put out of action, a hole driven in her side and part of her stem broken into splinters, but the coxswain went on bringing his battered boat up to the wreck until 19 men had been rescued before the trawler was floated by the rising tide and swept away.

Such stories of daring and devotion in storm and darkness, and on the strangest of errands, could be continued with instances from the Shetlands, the Atlantic Coasts of Scotland and Ireland, and indeed from every other point around our coasts. One service that we shall always keep in mind is the help that the life-boat service has given to our fighting

men, especially to airmen brought down or crashed in the sea. Continual watch is kept for rafts and dinghies, and whatever the weather no effort is spared to rescue men afloat. When an aeroplane came down in the sea off Whitby, and the four airmen took to their rubber dinghy, the coxswain and crew of the life-boat were out in their fishing boats and only the motor mechanic remained on shore. Something had to be done, so with an ex-coxswain of 71 in command, a man of 60 as his second, and five boys of 16 as crew, he got the life-boat launched, and in 35 min. he and his scratch crew brought back the four airmen, all of whom were injured. It was at Whitby too that the first two life-boatmen lost their lives in the war.

Older men and boys, landsmen and seamen, soldiers, sailors and airmen have joined in the work when



The veteran motor life-boat "Agnes Cross," built in 1921. Until 1939 she was stationed at Lowestoft, where she was launched 125 times and rescued 209 lives. Photograph reproduced from "The Life-boat Service and the War" by courtesy of H. Jenkins Ltd., Lowestoft.

their help was needed, hauling on launching ropes or manning the life-boats themselves. The older lifeboats too have gone back into service, to replace those destroyed in air raids or lost in other ways. One of these is the "Agnes Cross," shown in our illustration. When new she was posted to Lowestoft in 1921 and was replaced there in the second month of the war, when she was relegated to the reserve fleet. But it was then that her adventures began. She spent two years at different stations on the south-east coast and was at Dover in the days of Dunkirk and in the following months, in all saving 65 lives before leaving to be repaired after being damaged in an air raid. Her voyage to Lowestoft for this purpose was even more exciting than her stay at Dover. To begin with she was shelled by the big German guns on the French Coast. Then she was bombed off Broadstairs and at Margate, as well as being machine-gunned, and on her way north she made contact with a convoy that also was bombed. Now she is on the coast of County Cork, still active although she is 23 years old and has the saving of nearly 300 lives to her credit.

* "The Life-Boat Service and the War: Four and a Half Years." Royal National Life-Boat Institution, Life-Boat Depot, Boreham Wood, Herts. Price 1/-, post free.

Streamlined Trains at Home and Overseas

THIS month's cover, showing the L.M.S. "*Coronation Scot*" breasting the summit of a 1 in 70 incline, reminds us of a sight that had become familiar during the two years before the war, and one which we hope we may soon see again. This blue flyer, affording a 61.7 m.p.h. journey between London and Clydeside, was necessarily withdrawn on the outbreak of the war, as also were the high-speed streamlined expresses of the L.N.E.R.

In this country the year 1929 saw the first real breakaway from the conventional steam locomotive shape. This was due to that bold and enterprising designer the late Sir Nigel Gresley of the L.N.E.R., who in the unusual No. "10000" produced for the first time a steam express locomotive to which a water-tube boiler was applied. This was a daring design, incorporating the high boiler pressure of 450 lb. per sq. in., and compound working with two high-pressure and two low-pressure cylinders. What attracted popular notice, however, was its unusual outline. From the side view it appeared to be all boiler above the wheels, with the cab developed as it were at the trailing end; and it might have been suspected that it had no chimney! Examination of the front end, however, showed that the boiler clothing sheets were extended right forward, and enclosed, except at the front, the smoke-box, which had a flat sloping top through which a severely plain chimney projected. The object of this was that the extended clothing sheets and the sloping smoke-box should form a kind of "trough" in which the chimney was situated, and so the upward current of air as the engine ran forward would help to lift the smoke and exhaust steam well clear of the cab windows and so provide the enginemmen with an unobstructed lookout.

Although No. "10000" did not prove as economical and efficient as had been hoped, its contours certainly indicated the shape of things to come in the way of locomotive outlines. For in 1934 there appeared another departure from accepted practice, again on the L.N.E.R., in "*Cock O' The North*," No. 2001. This was a 2-8-2 tender engine, and was the first eight-coupled locomotive to be designed for passenger service on a British main line. This giant had a normal fire-tube boiler with wide fire-box, but in externals it followed the general lines that had been adopted in the experimental No. "10000." Taken all round, however, the newer engine had a more attractive appearance than No. "10000."

Neither No. "10000" nor "*Cock O' The North*" was

designed with the idea of obtaining higher speeds, but no doubt they afforded very useful data when the time came to provide streamlined locomotives for working a really high-speed service.

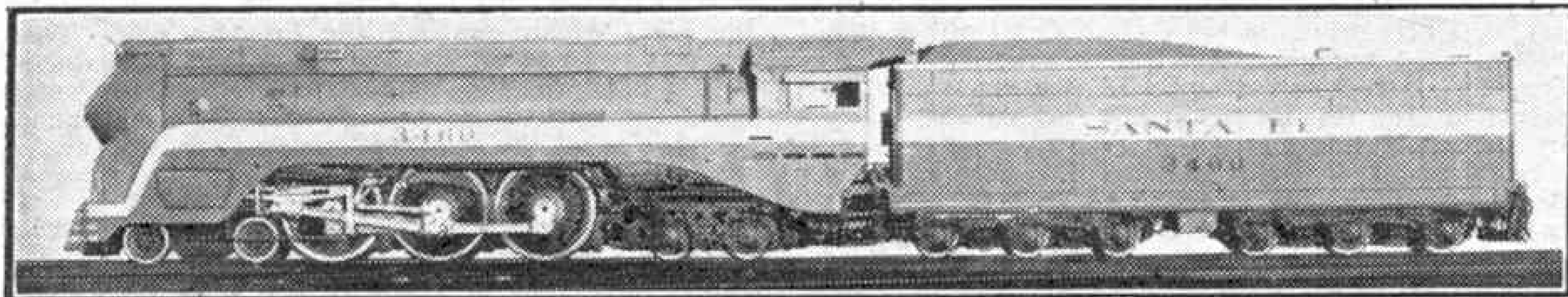
Much attention had been given abroad to the development of more speedy rail services, resulting in such notable oil-electric light-weight units as the experimental "*M. 10000*" of the Union Pacific Railroad in the United States and the "*Flying Hamburger*" of the German State Railways. With a view to seeing what could be done with steam, the L.N.E.R. carried out two remarkable test runs. In the first, late in 1934, from London to Leeds and back, with the



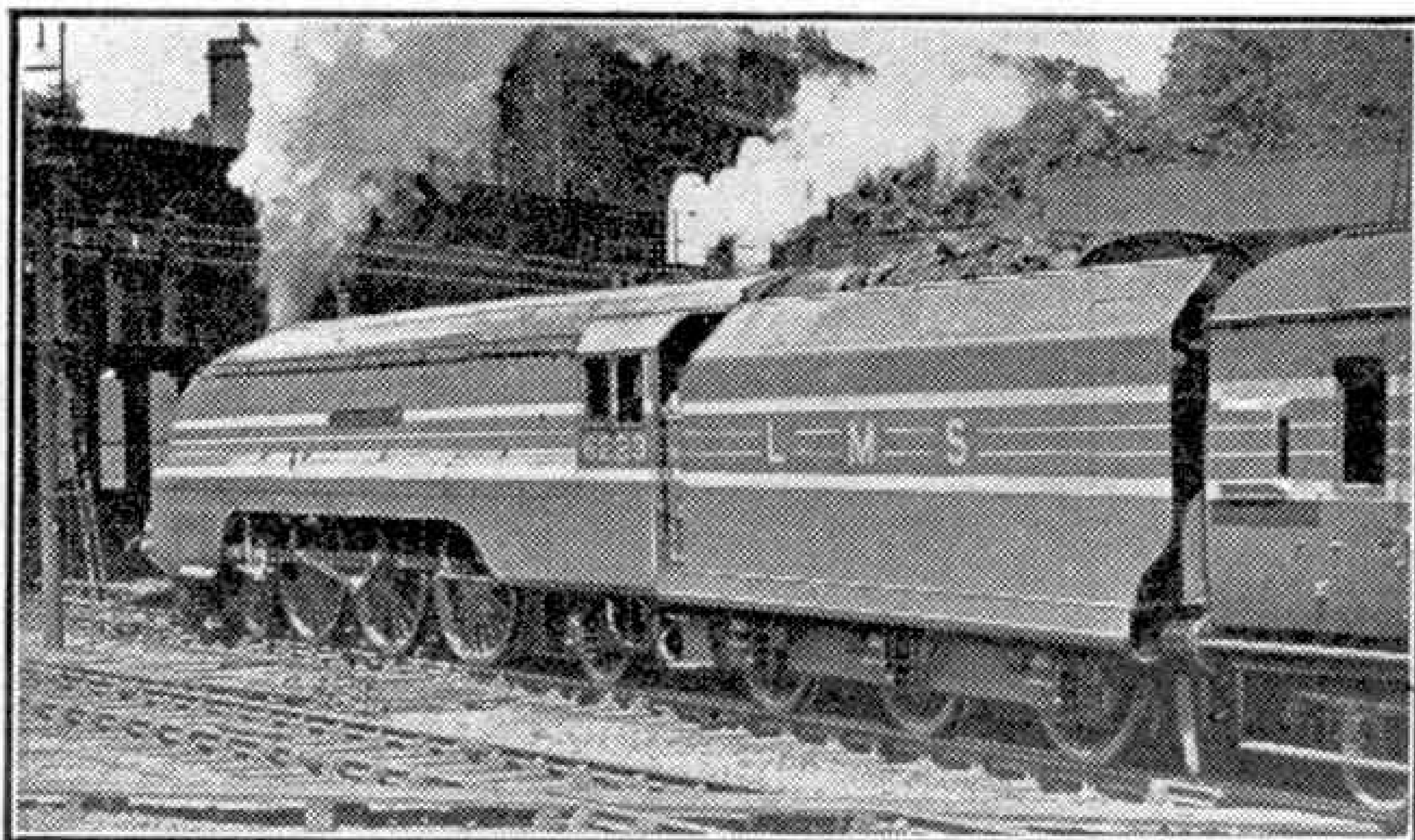
L.N.E. No. 4463 "*Sparrow Hawk*" going North with a heavily-loaded East Coast Express.

well-known "Pacific" No. 4472, "*Flying Scotsman*," the redoubtable Driver Sparshatt managed to reach the magic figure of 100 m.p.h. Early in 1935 one of the later A3 class "Pacifics," No. 2750, "*Papyrus*," made the second run, this time to Newcastle and back. Both the down and the up journeys were completed in less than four hours and a maximum of 108 m.p.h. was reached on the up run.

As a result it was decided to introduce a special high-speed service between King's Cross and Newcastle with a schedule of four hours each way. To work it a special streamlined train was to be provided, and an improved design of Gresley "Pacific," also streamlined, was to be put in hand. Thus came about the inauguration of "*The Silver Jubilee*," so named in honour of the Silver Jubilee of King George V, which was celebrated in 1935. The whole train, novel in outline and finish as in its interior arrangements,



Baldwin 4-6-4 locomotive No. 3460 built for Atchison, Topeka and Santa Fe Railway. Photograph by courtesy of The Baldwin Locomotive Works, U.S.A.



The "Coronation Scot" headed by streamlined 4-6-2 No. 6223 "Princess Alice." Photograph by J. P. Wilson, West Bridgford, Nottingham.

and headed by the first A4 streamlined "Pacific" No. 2509, "Silver Link," was a fitting instrument with which to inaugurate this departure from the accepted British operating methods. To ensure time-keeping, accommodation was limited to that afforded by the special set of vehicles, so that no extra stock was to be added; and a supplementary charge was made over and above the normal fare.

The four 4-6-2s originally provided for "The Silver Jubilee" were developments of the highly successful Gresley "Pacifics." More efficient high-pressure boilers and improved front end design were embodied, but most striking of all was the external contour. The front of the engine was made of horizontal wedge-shape form, completely enclosing the smoke-box and merging gracefully into the boiler clothing, the dome and other projections being shrouded over to provide a smooth unbroken surface from front to rear. The normal footplating was absent and was replaced by a casing that embraced the cylinders but was cut away to reveal driving wheels and most of the outside motion, while its upper surface ran back to the cab in a sweeping curve.

Continuing the "unbroken line" idea, the tender was made to match the cab roof and the space between the two was filled in by a rubber sheet. The spaces between the coaches of the train were dealt with similarly, and to carry the idea still further, metal shrouding between the coach bogies was introduced, extending from frame level to within a short distance of the rails. The reduction of air resistance in this way throughout the train was of special value to the engine set to make an overall average of 67 m.p.h. over the 268 odd miles between King's Cross and Newcastle. The wedge-shaped front end was adopted to secure efficient deflection of the exhaust from the chimney and to reduce lateral disturbance of the air to a minimum. How well the exhaust is thrown up clear of the cab windows is well shown

in the upper illustration on the previous page.

In the meantime another champion of the cause of steam had arisen in the United States in the shape of the "Hiawatha" express service of the Chicago, Milwaukee, St. Paul and Pacific Railroad. This had begun a few months before our own "Silver Jubilee," and with separate eastbound and westbound trains starting at the same time of the day, linked Chicago with St. Paul in 6½ hours for the 410 odd miles.

So the age of the streamlined train set in, and while both the "Jubilee" and the "Hiawatha" were winning their spurs amazing ingenuity was being displayed in the development of improved equipment, especially for transcontinental travel, in the United States. Improved

riding and accommodation, novel outlines and colour schemes and a higher standard of speed all round were all features in the efforts of the railroad to compete against the rapidly developing air travel.

Diesel-electric traction came to the forefront in the United States for rapid long journeys, and from the original three-car unit of the Union Pacific "M10000" there were developed great transcontinental trains of up to 17 vehicles with complete restaurant, sleeping and observation facilities, such as the "City of Los Angeles," claimed to be "the longest streamliner in the world." For this and similar services giant twin unit Diesel-electric locomotives were built that were literally power houses on wheels. Typical in appearance of most of the Diesel-electric power plants is the locomotive of the "City of San Francisco," illustrated below.

While the Diesels of the different railroads had a certain amount of sameness about them, great variety



U.S. streamlined express "City of San Francisco."

in streamlining effects was seen in steam locomotives. Some became practically all "covered in," as were the engines developed for the "Hiawatha." Others, while "cleaned up" generally by the application of sheet metal covering in various forms, still partook of definite steam locomotive character. A good example is No. 3460 of the Atchison, Topeka and Santa Fe line shown in the lower illustration on the previous page.

(Continued on page 214)

Air News

The Latest "Spitfire"

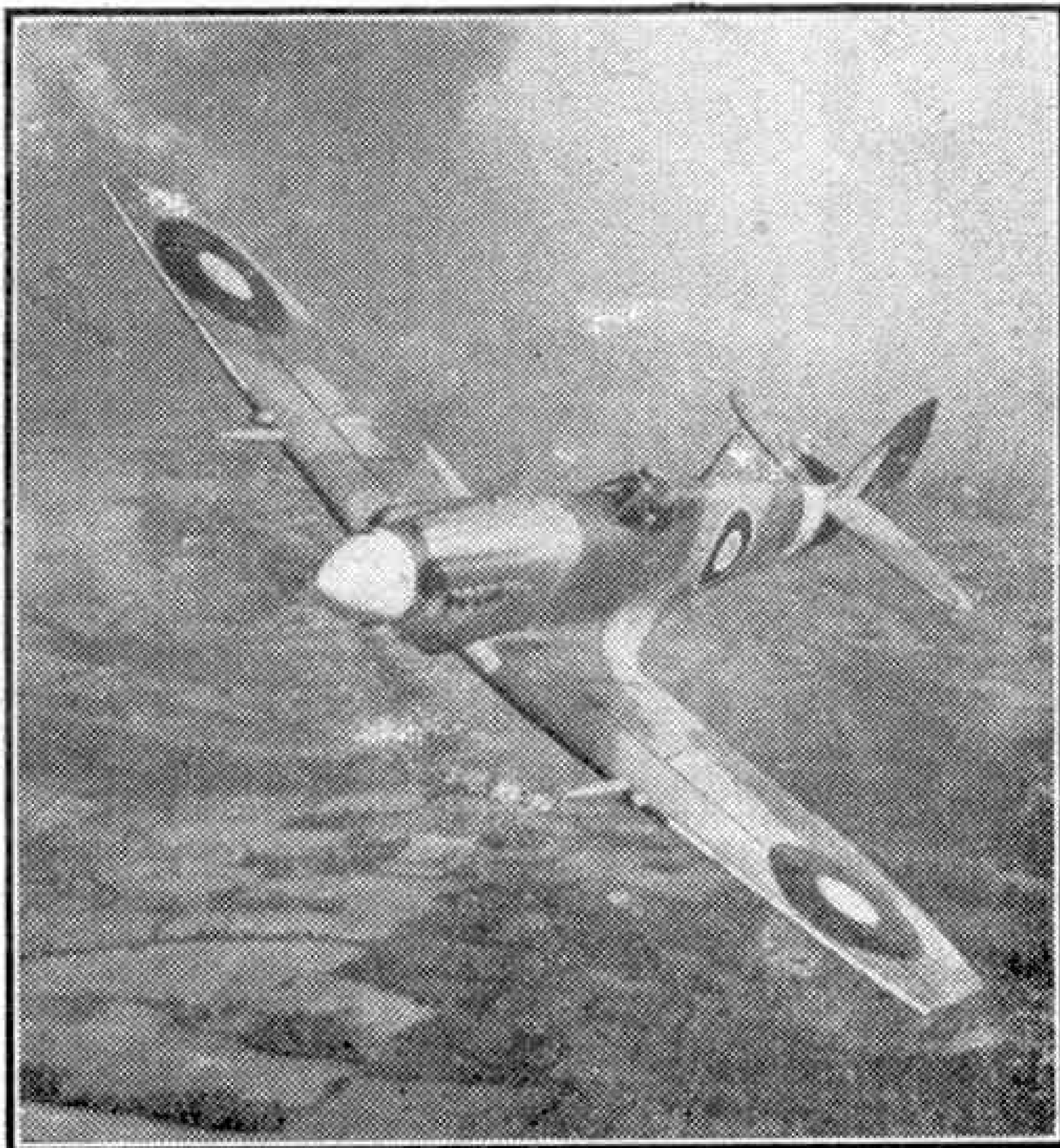
The "Spitfire," long famed as one of the world's finest high-altitude fighters, has now emerged as a most sensational low-altitude fighter. This version, the "Spitfire" XII, is shown in the upper photograph on this page. It does not differ much externally from earlier "Spits," but it has a strengthened fuselage with a completely new type of engine mounting, and is fitted with a Rolls-Royce "Griffon" engine. Clipped wings help to improve speed and manoeuvrability low down, the cowling lines have been improved, and the tail wheel is retractable. An interesting feature is the single radiator, as against the twin radiators of the high-altitude "Merlin"-engined Mark IX machine.

The "Spitfire" XII was designed in 1940 by Vickers Supermarine in close co-operation with Rolls-Royce. The prototype flew in 1941, and the first production aircraft was delivered during 1942. Since then the Mark XII has come into service in increasing numbers, and has been an outstanding success. J.W.R.T.

Vickers "Warwick"

Details of another British aircraft have been officially released. This is the twin-engined Vickers "Warwick," developed before the war from the famous "Wellington," a type which began as a bomber and has served in many other roles during the war. The "Warwick" was intended to be the successor of the "Wellington," but before quantity production of it could be started the 4-engined heavy bomber came into favour. It is now in service, but has been given other duties, only one of which—that of freight transport—has been revealed.

The "Warwick" is a middle wing monoplane of 96 ft. 8½ in. span, and is 70 ft. 6 in. long. Like the "Wellington" it is built on the Vickers-Wallis "geodetic" system of construction, which combines great stiffness and strength with low weight, and by dispensing with bulkheads permits the interior of the wings and fuselage to be clear of any obstruction. Points of difference between the two Vickers aircraft are the greater wing span and longer nose of the "Warwick," the placing of its pilot's cabin well forward of the airscrews, and the projection of the



A fine view of the clipped-wing "Spitfire" Mk. XII low-altitude fighter.

engine nacelles beyond the trailing edges of the wings. The engines of the "Warwick" are Pratt and Whitney "Double Wasps" of either 1,850 h.p. or 2,000 h.p.

Brewster "Bermuda" Dive-Bomber

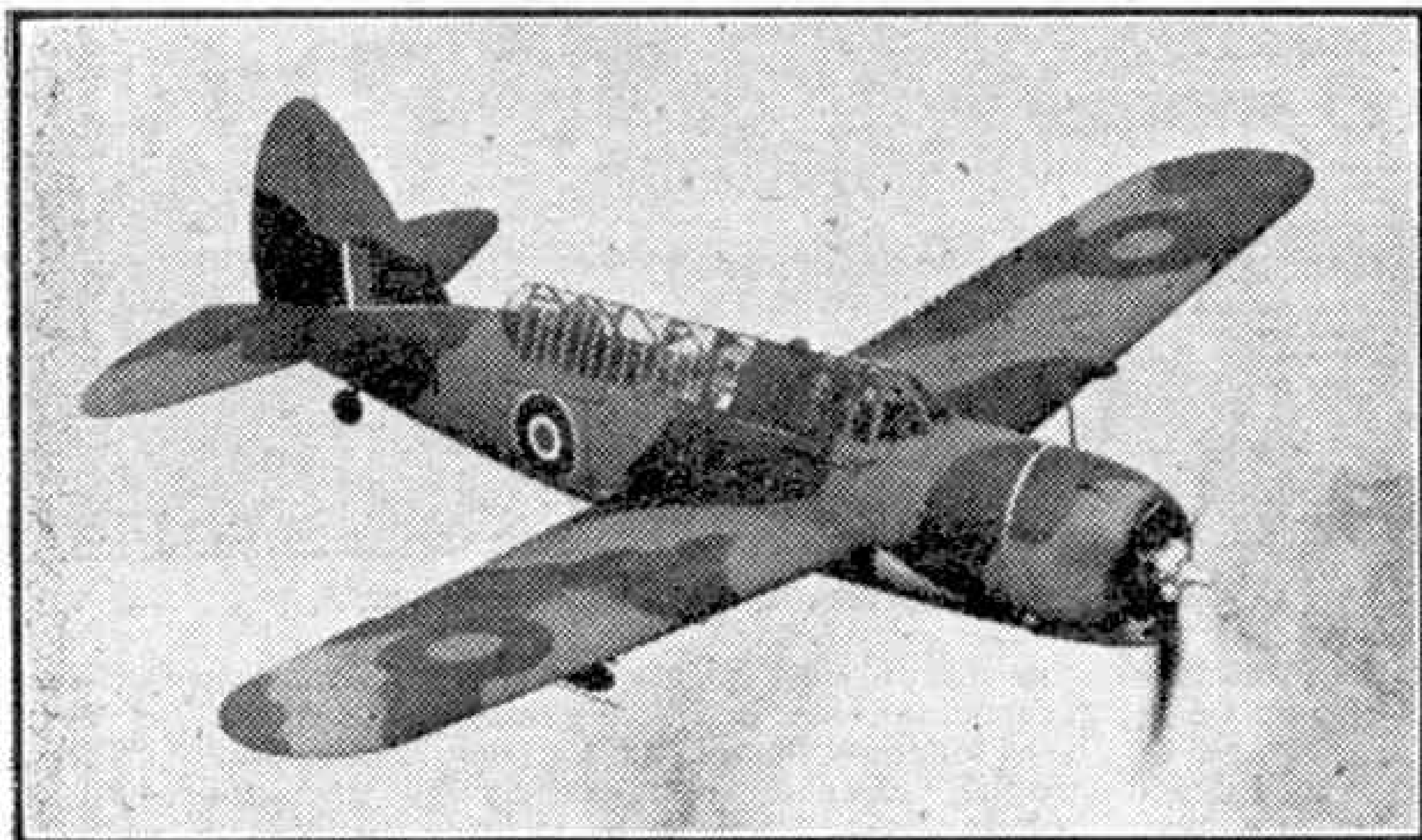
The lower photograph on this page shows the Brewster "Bermuda," one of the first dive-bombers to go into service with the R.A.F. The armament of this American machine is still secret, but is known to include forward-firing machine guns mounted in the top of the engine cowling and in the wings, and movable guns in the rear cockpit. The "Bermuda" originally had a "bubble" turret similar to that of the Grumman "Avenger," but this has been dispensed with. The normal offensive load is a 1,000 lb. bomb carried inside the fuselage, and for "delivery" slung clear of the airscrew by ejector arms like those on the German Junkers Ju 87. In addition a 500 lb. bomb may be carried under each wing. It has a maximum range of about 2,500 miles. An arrester hook can be fitted for deck landing on carriers.

The "Bermuda" is also in service with the U.S. Navy, under the name of "Buccaneer." J.W.R.T.

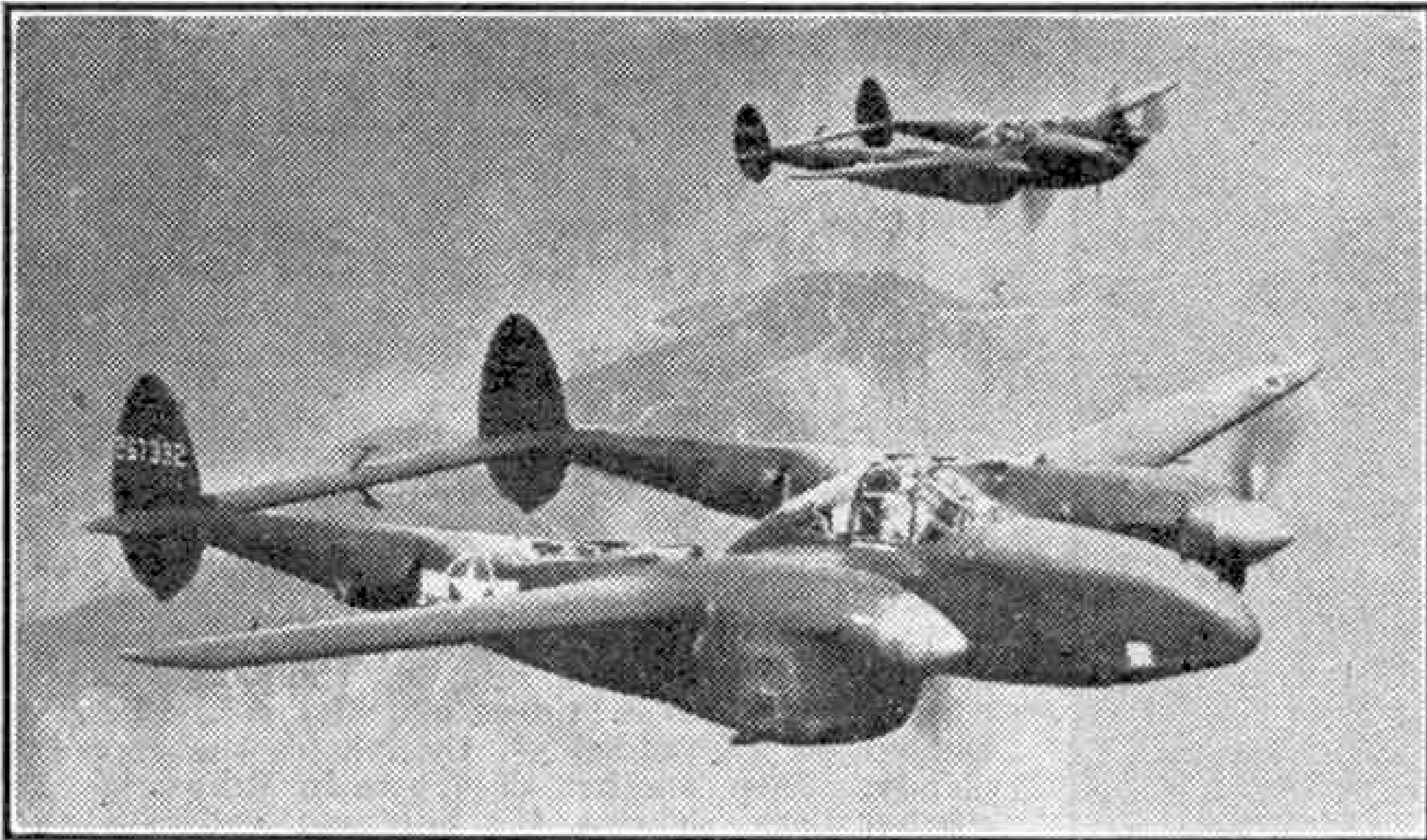
Another Fast Transatlantic Flight

On the 17th April last one of the Vought-Sikorsky 44A four-engined flying boats of American Export Airlines, Inc., set up a new record for these aircraft by making the 2,780-mile non-stop flight from New York to Foynes in 15 hrs. 20 min., which was 21 min. less than the previous best time they had achieved on this route.

Since the article on the Republic "Thunderbolt" in last month's "M.M." was written, it has been announced that machines of this type are being used by the Red Air Force.



Brewster "Bermuda" dive-bomber, an American type used by the Royal Air Force and referred to on this page. Photograph by courtesy of the Brewster Aeronautical Corporation, U.S.A.



The "Lightning" F-5, a new version of the famous Lockheed P-38 fighter, and equipped with cameras instead of guns. The illustrations on this page are by courtesy of the Lockheed Aircraft Corporation, U.S.A.

Camera-Armed "Lightning"

The Lockheed P-38 "Lightning," world-famous as a fighter, is now also in service in the less aggressive role of high-speed reconnaissance aircraft. This version, called the "Lightning" F-5, is armed with cameras instead of cannon, and a photograph of it appears above.

Stripped of its armament, the F-5 is several hundred pounds lighter than its fighter counterpart, and is capable of additional speed, with greatly improved flight characteristics. It carries a battery of charting and reconnaissance cameras with lenses varying in focal length from 6 to 40 in. The cameras are controlled by an electrical impulse unit, and may be operated singly or collectively. The F-5 can photograph large areas, and, with its great speed, get away before enemy gunners can adjust their aim.

The cameras "shoot" through special glass windows set flush with the fuselage, and located at angles that depend on the cameras used. On some F-5s two cameras take overlapping pictures, "shooting" straight down from a single window. The most common set-up, however, consists of three cameras to photograph three different surface views, one being parallel with the ground, flanked by two others the optical axes of which are depressed 30 deg. below the horizontal. The result is a series of photographs which together take in a "slice of territory" from horizon to horizon.

Photographic reconnaissance pilots must get to their objectives, eluding enemy pursuit 'planes, wade through flak to take their pictures, and then get back to base in the shortest possible time, without benefit of guns to fight off attackers. They must be able to soar to stratosphere heights for some pictures; dive to roof-top levels for others. Commenting recently on the important work of these aircraft, Gen. H. H. Arnold, chief of the U.S. Army Air Forces, declared that in some circumstances a P-38 with cameras had rendered more important service than a P-38 with guns. "Our photo-reconnaissance pilots are instructed," he said, "to fly on the theory that fighter 'planes win battles, while camera 'planes win wars."

Shipping Companies to Run Air Services

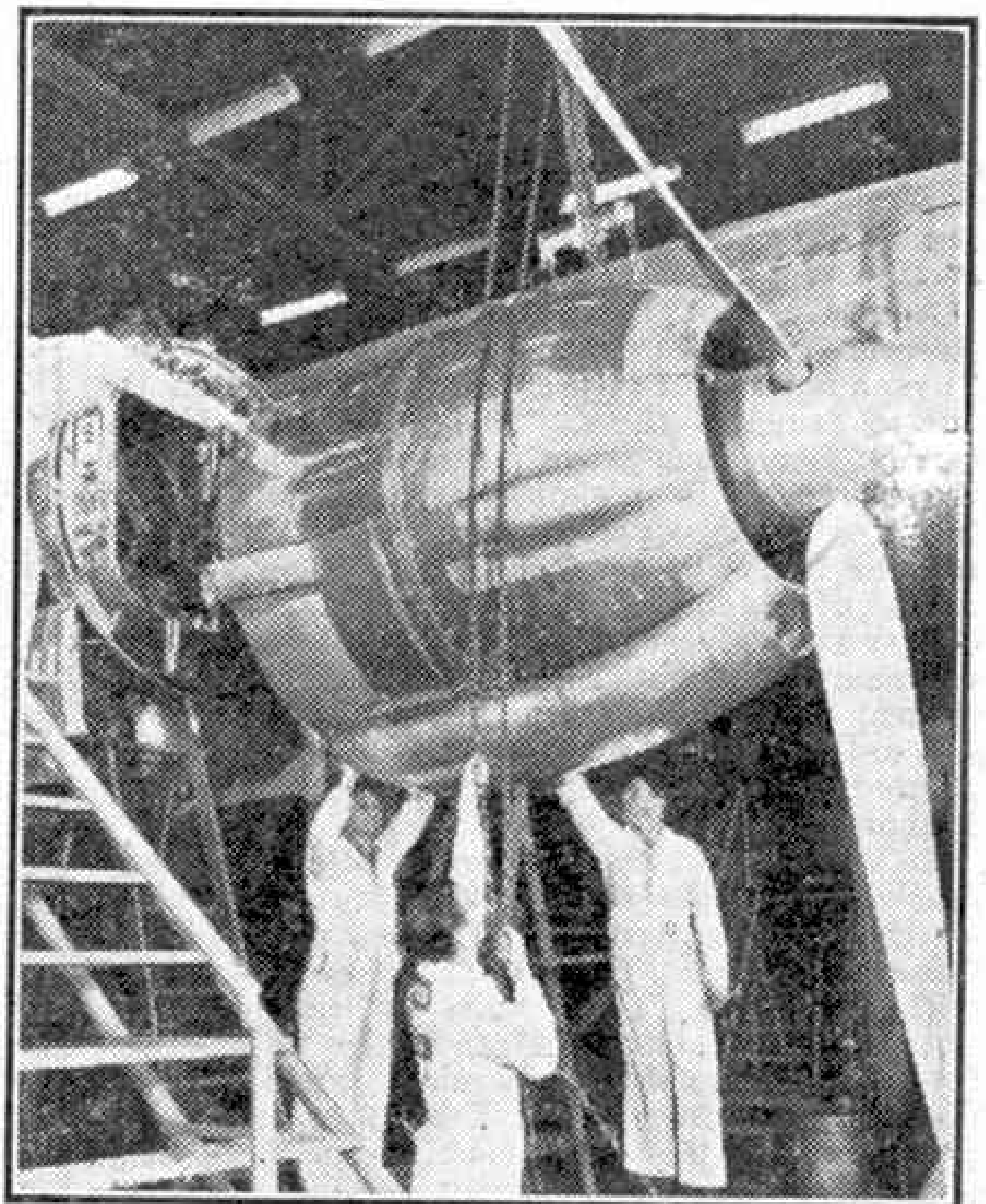
There will be a tremendous increase in air travel after the war. Mr. W. A. M. Burdon, U.S. Assistant Secretary of Commerce, believes that then U.S. aircraft will carry about 20,000,000 passengers a year!

The big shipping companies in Britain, the United States, and Portugal have realised that this greatly increased air traffic will become a serious rival to sea

transport. In Britain five of these companies, the Royal Mail, Blue Star, Booth Steamship, Pacific Steam Navigation, and Lamport and Holt, have got together and formed an air transport organisation which they have named Britain-Latin American Airlines Ltd. This new firm is intended, as its name indicates, to operate between this country and South America.

Similar steps to obtain a share of the post-war boom in air traffic are being considered by the big U.S. shipping companies. In Portugal the four chief shipping companies and the air transport firm Aero Portuguesa Limitada have formed a new company to establish commercial air services to Portuguese colonies and to Brazil after the war. The scheme is to be submitted to the Portuguese Government.

During the past year some of the leading air transport firms have revealed in part their plans for encouraging and exploiting on a big scale air traffic after the war. The ambitious post-war schemes of one company, American Export Airlines, Inc., were described in the March "Air News" pages. Air travel will be faster than ever before, and a hint of what will be accomplished in this direction was given by Lord Knoll s, Chairman of British Overseas Airways, when broadcasting in Australia during his recent visit. He indicated that after the war there would be an air service between Australia and Britain by which passengers leaving Sydney on a Friday evening would be in London by Monday.



Expert servicing: Fitting a 2,000 h.p. Wright "Cyclone" engine to a Lockheed C-69 "Constellation" aircraft. The method employed allows a change of engine to be made in 27½ minutes.

Map-Making on the March

By David Gunston



Inside the lorry in which maps are made from aerial reconnaissance photographs. The lamps are being adjusted for making an exposure in preparing the printing plate.

MAP-MAKING has always been an important business and in wartime soldiers' lives may well depend upon the accuracy of the maps used for campaigns. In modern warfare, when new country has to be captured, the first thing the military commanders have to do is to get a pretty accurate idea of what the new country looks like. This has to be done before any assault can be planned in detail, and it is where the R.A.F. now comes to the aid of the Army.

Aeroplanes of the Air Force Photographic Reconnaissance are sent up. These may be "Lysanders" or "Spitfires" or, if the territory is out of range of these, "Mosquito" IXs. Each carries twin long-range cameras with which they proceed to make a detailed survey of the area to be covered. Hundreds of pictures may be taken, each covering only a few square miles of enemy-occupied territory, and a 60 per cent. overlap is allowed on every print to ensure that nothing is missed. The planes return, and immediately their film magazines are unloaded, the photographs developed and printed, and handed over to the military authorities.

It is here that the real work begins, or the map-making side of it, at any rate. Units of the British Army, and especially of the Canadian Forces, have been formed to cope with this work. These units are mobile, and are housed in lorries so that the advancing forces can make their own maps. Field Survey Companies of the Royal Canadian Engineers do most of the work, which is a highly specialised job. The survey section sees to the more technical side of the matter, dealing with the control for the areas to be covered, and the scales to be used.

The vehicles used are great specially-designed lorries, completely self-contained, some for the

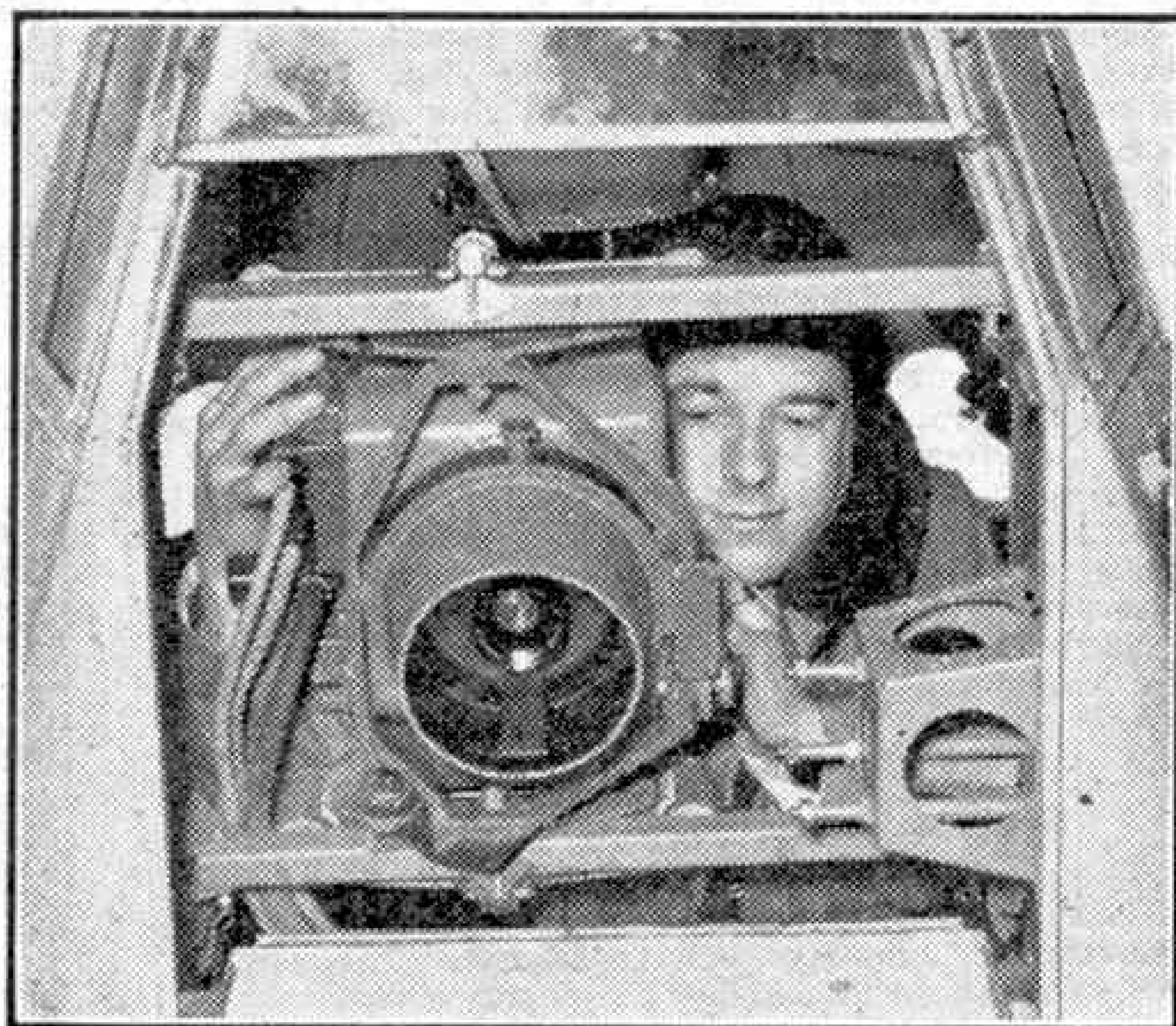
camera work, others for the processing and printing of the maps, and some to house the men. Each represents a unit in the vast map-making organisation. Hot and cold water, electric generators driven by the engines, and delicate scientific apparatus are all fitted into these vehicles.

When the batches of pictures arrive from the R.A.F. they are taken into the compiling room, where such details as bridges, gun-sites, rivers, barriers and so on are added on the photos and marked plainly. Then another draughtsman draws in the contour lines, showing the hills and valleys as he sees them when he views the pictures through a stereoscope that "brings out" the third dimension.

Then the original photos are thrown on to a screen by means of an epidiascope—you probably have one of these at school—and a new tracing is made of the image. Fresh photographs are then made of this inside the lorry on a zinc plate that has been given a coating of material sensitive to light, and it is from this zinc plate that the final printing is done. Even the air inside the dark-rooms necessary for this work is specially conditioned.

The zinc plate has to be polished and given a satin-smooth surface. This is done by rocking it to and fro rapidly in a tray of glass marbles, by electricity. The noise in this lorry is deafening, as you might guess! The sensitised plate is dried, having been well lubricated when undergoing surfacing, and the exposure before powerful arc lamps is then made. The plate itself is then developed and rushed to the press lorry, where on an electrically-driven transfer printing press the copies are dashed off at a very high speed. If there is time—and if a vital battle is about to be fought there usually isn't—several plates are made, each one bearing a different colour, and they are then superimposed to make a three-colour map.

Within a matter of hours from the receipt of the aerial pictures the new up-to-date maps are in the hands of the commanders.



The beginning of map making on the march. The R.A.F. observer who photographs the area to be mapped.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller. We can supply copies to readers who are unable to place orders in this manner. Order from Book Department, Meccano Ltd., Binns Road, Liverpool 13, adding 6d. for postage.

"A HISTORY OF THE AIR MINISTRY"

By C. G. GREY (Allen and Unwin, 10/6 net)

In this book Mr. Grey tells the story of the Air Ministry up to our declaration of war against Germany on 3rd September 1939. His object in writing the book, he tells us, was that of providing a clear and simple history of how and why the Ministry came into being, how it is organised, and what it has accomplished; and in this object he has succeeded admirably.

In the Services the beginning of real aviation, that is air navigation as distinct from the use of captive balloons, dates from 1910. Much progress was made during the next two or three years, and the Royal Flying Corps was established with a Military Wing and a Naval Wing.

Mr. Grey gives a most interesting account of the agitations and demands that resulted from our air unpreparedness when war broke out in 1914. Enquiries, reports and Air Boards followed thick and fast, and ultimately in 1917 the Air Ministry was born. The chapters dealing with the period from 1917 to the end of the war are intensely interesting.

Part II of the book deals with the organisation of the Air Ministry and of the Royal Air Force. It includes a vast amount of information and in itself forms a valuable reference book.

Part III covers the whole period between wars, and probably will be the most attractive to "M.M." readers. Mr. Grey gives us a sort of running commentary on the outstanding events in the air, both Service and Civil, and recalls many things that most of us have forgotten. We have not space to follow him in his course, but it may be said that every page is of interest. The dark side of the picture is the disarmament policy, the bitter harvest of which we reaped in 1939. In 1932 we reached our lowest ebb in the air, the Air Estimates for 1932-3 being, in gross total, nearly one and a half million pounds lower than in 1931. The turning point in British Air Power came in November 1933, when, as the result of debates in both Houses of Parliament, the country began to be seriously concerned about the rebuilding of the Air Force.

The success of the first Empire Air Day Celebration on 24th May 1934 showed that the British people were really interested in air affairs, and made it clear that the Government could push on with the building of an adequate Air Force. From that time matters began to improve, and high-pressure expansion followed. In 1936 the Home Defence Air Force was organised into four commands, Bomber Command, Fighter Command, Coastal Command and Training Command. Great efforts were made to increase the output of aircraft and engines, and the now famous Shadow Factories scheme came into being. During the next two years progress was even more rapid, and in 1938 the Air Ministry expansion was enormous. In that year the British Overseas Airways Corporation was established.

And so we come to 1939 and the present war. In his last two chapters Mr. Grey gives a striking survey of the state of our Air Power in what he calls "The Year of Reckoning."

"THE WHITE PANTHER"

By THEODORE J. WALDECK (Harrap, 6/- net)

This is a story of the jungle country of South America. In 1937-38 the author organised and led an expedition to British Guiana, in which he penetrated the upper reaches of the Cuyuni River, where until then no white man had ever ventured. In the vast jungles there he heard from Indians of a white panther that was exceptionally cunning and ferocious, and this is the hero of his thrilling story, which at the same time conveys to its readers a fine idea of the amazing country at the back of beyond in British Guiana.

Ku-ma, as Mr. Waldeck calls his white panther, was outstanding almost from his birth, fending for himself when his brother and sisters of the same litter were still being carried and tended by his mother. It was not long before he found himself entirely alone, hunting for his living as he had seen his mother do, and it was then that his education began. The school of experience in which he lived led him into many dangers, for he was ignorant of the

ways of other jungle creatures, and so confident of his own prowess that he let himself in for many unpleasant surprises. On one occasion he attacked what he had at first thought to be a log lying half in and half out of the water of the river, to discover that he had tackled an alligator in its own element. Wild pigs, wild dogs, a mighty python and a black-spotted yellow jaguar proved equally terrible adversaries, and there is a thrilling account of the terrific battle that the young panther fought against the jaguar when this creature tried to rob him of a deer that he had killed. His most dangerous opponent he found in man. He escaped from a cunning trap set for him, however, and flashed away into the jungle, a powerful grown-up beast wise in the ways of men and other creatures.

The book is illustrated by excellent animal drawings.

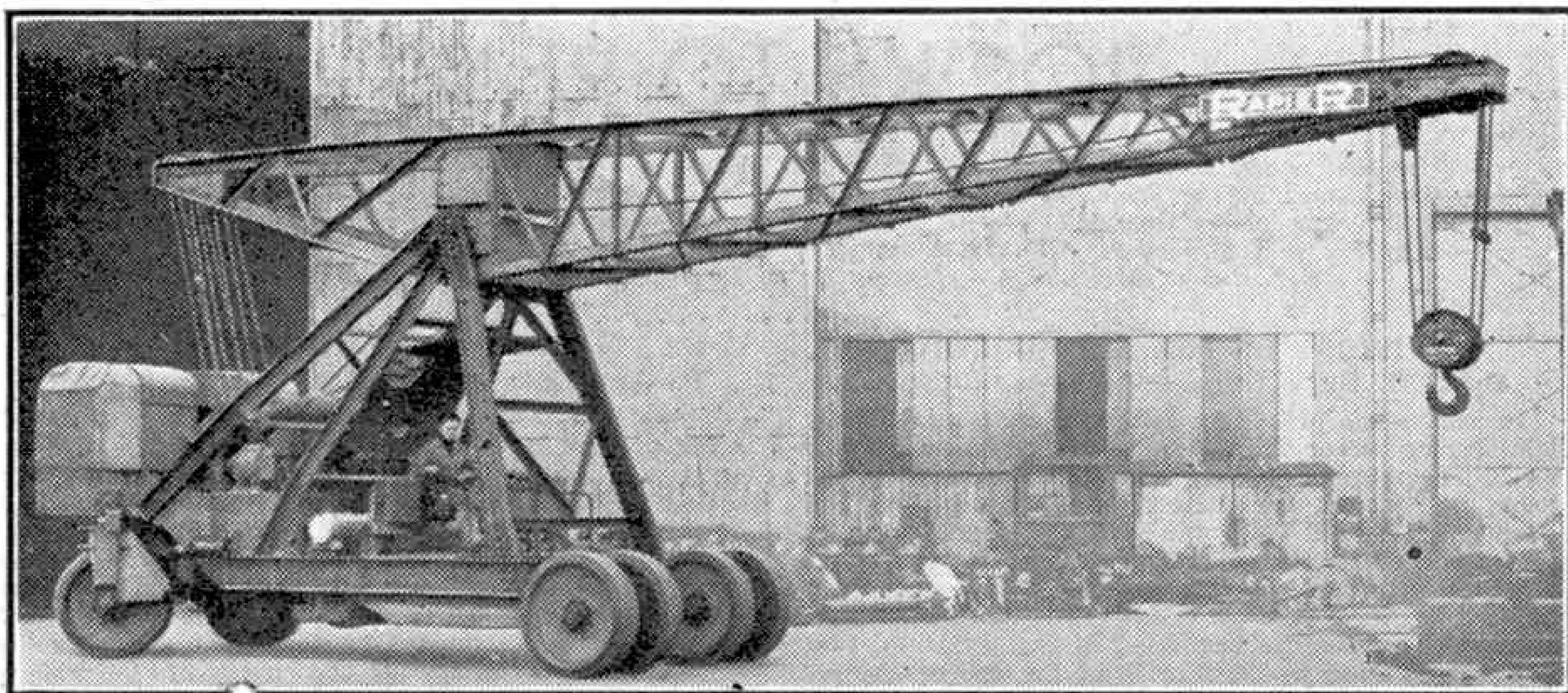
"I HAVE JUST BEGUN TO FIGHT"

By COMMANDER E. ELLSBERG (Harrap, 7/6 net)

John Paul Jones was the first hero of United States naval history. With Tom Folger, the hero of this fine yarn, who goes to sea in a whaler, we meet him first in Tobago, where the boy is sent to learn something of navigation from him, and then in the United States during the fight for independence. Eventually he sets sail from France with a tiny fleet to strike hard against this country, raiding Whitehaven to good purpose. Then comes his greatest fight, off Flamborough Head, and of this we have a really thrilling description. The American's hull was shattered by the heavier guns of his opponent and his crew sadly reduced by fierce fighting that swayed backward and forward across the decks of the two vessels. It was at this point, when his surrender was demanded, that he made the reply that forms the title of the story, and he fought on to win.

From start to finish, with desperate whaling adventures in the North Atlantic and with sea fights in the New World and the Old, the book is full of thrills. There are 16 full page illustrations.

Owing to wartime difficulties, it is impossible to guarantee prompt delivery of books ordered as described at the head of this page, but every effort will be made to ensure speedy despatch.



The new Rapier 10-ton Standard Mobile Crane. This is electrically driven and controlled, and incorporates many interesting features described in the accompanying article. Photograph by courtesy of Ransomes and Rapier Ltd., Ipswich.

Engineering News

The New Rapier 10-ton Mobile Crane

Mobile cranes are now employed for many purposes, and on this page we reproduce a photograph showing the latest development of this type, a crane that can handle loads of 10 tons at a radius of more than 22 ft. This is the new Rapier 10-ton Standard Mobile Crane, made by Ransomes and Rapier Ltd., Ipswich, and it has many novel features of the greatest interest.

As will be seen from the illustration, two triangular frames braced together carry a cantilever jib at their apex. At the rear of the framework is a cast iron bedplate for the machinery. This includes a petrol engine and a direct current generating set driven by it that supplies current for the motors through which travelling, hoisting, the derricking movement of the jib and steering are effected. The current voltage varies from 50 to 250, according to the speed of the petrol engine, which is controlled by means of a foot accelerator, as in an ordinary motor car.

Switches for controlling the hoisting, derricking and travelling motors are mounted on a pillar on the driver's right, and he steers by means of a handle on a desk in front of him. Movement of this handle switches on the steering motor, which turns the steering wheels more quickly the farther it is moved from the central position; the handle is not like the steering wheel of a car, however, as it leaves the steering wheels in the position they occupy when it is returned to the central position. An interesting point is that movement of the handle opens the throttle of the petrol engine slightly, so that current is made available for steering when the engine is only "ticking over." The control is also electrically interlocked with the travel switch, so that the steering mechanism cannot operate unless the crane is moving. Thus it is impossible to wear or damage the tyres by turning the wheels when the crane is not in motion.

There are six wheels to the mobile crane, four in front and two behind, and all are provided with solid rubber tyres. The front wheels are mounted in two bogies, and the rear wheels in steering castors. It is these rear wheels that are driven, and as each has its own motor there is no need for a differential.

The steering motor acts on the steering castor on the near side of the crane, and the two steering wheels

have a very wide range of motion, so wide indeed that at full lock the two are practically in line and the crane swings round a point on the line of the front axles. To provide for this a special arrangement was necessary for the tracking of the two steering wheels, since the Ackermann gear used in motor cars and lorries is not suitable for such a wide range of movement. In the new device, for which a patent application has been made, there is an oval cam pulley near the top of each castor shaft, and the two pulleys are linked by means of wire ropes so that the off side one automatically takes up its correct position as the other is turned by the steering motor.

The crane is so fitted that it can be towed by another vehicle. The tow bar is at the rear, and when towing is taking place the steering motor is disconnected from the near side steering castor. When this is done the offside castor becomes the steering one, and is so linked to the tow bar that the movements of this control steer the crane.

A Combined Digger and Bulldozer

An interesting new unit for moving earth has been introduced for the use of the armed forces in the United States by the Bucyrus-Erie Company. It can be used either as a mechanical shovel, a crane, or a bulldozer for pushing and levelling earth, and the changes necessary to adapt it for any use can be made in a few minutes. It is mounted on creeper track, and the digger bucket or bull-dozer plate is carried on the ends of gigantic curved arms that pass over the top of the unit. The overall height is only a little more than 8 ft., so that the machine can work in comparatively close quarters, and can readily be transported on trailers without special planning of routes. Oscillating tracks are used, so that the unit is stable on uneven ground.

Buckets in which the discharge gate is operated by compressed air are now in use for building concrete dams and similar work. With these there is no tugging or hammering on levers and about 15 sec. is sufficient for pouring a bucket load of concrete. The total time saved in building a great dam may be as much as three weeks.

The Vought-Sikorsky VS-300

By John W. R. Taylor

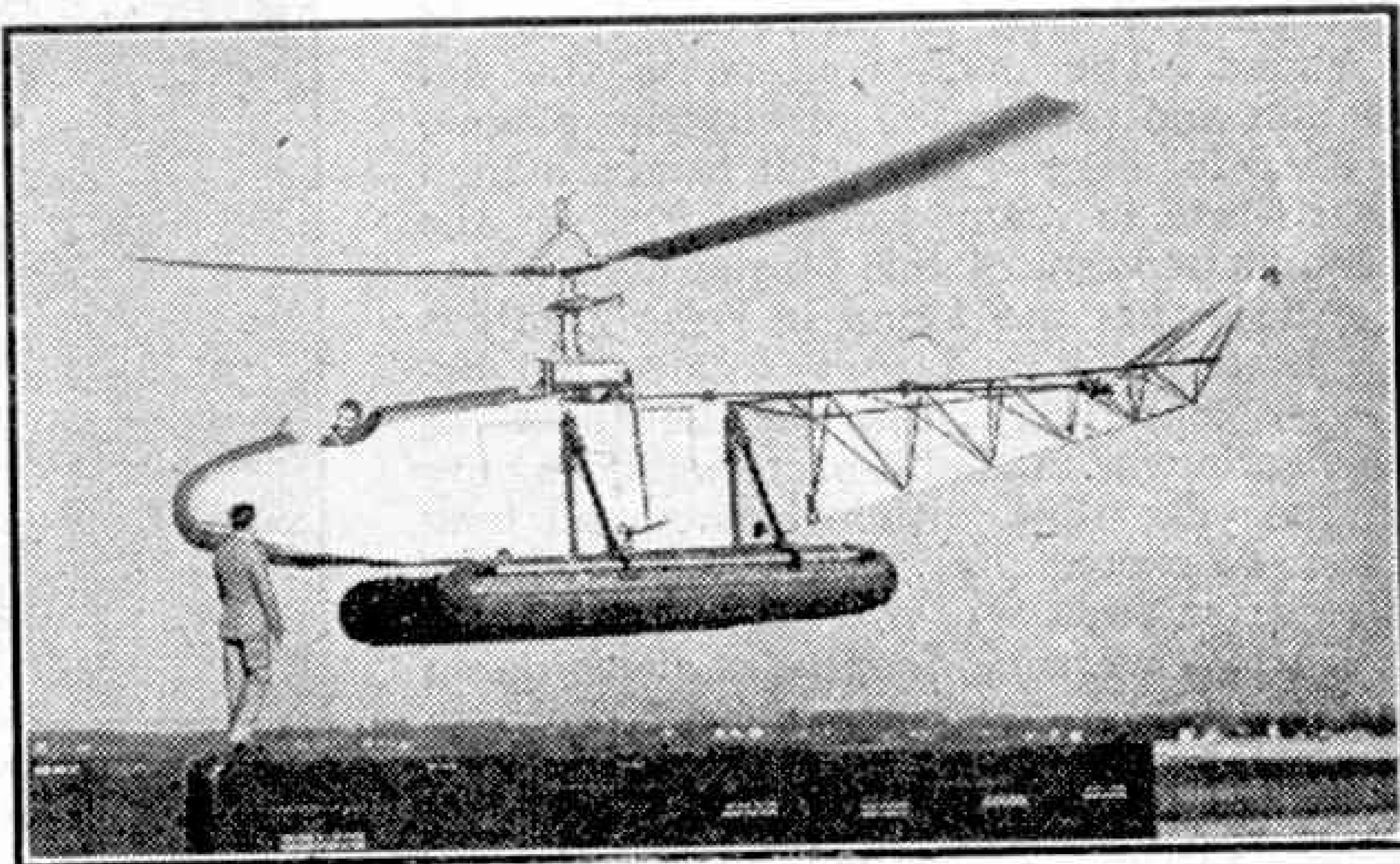
IN 1908 the great American inventor Alva Edison was asked for his opinion on the Wright brothers' biplane, to which he replied that no aeroplane would be good until it could go straight up and down. His motives for this statement are obvious; the normal aeroplane needs a long take-off run as its propeller has to pull it along the ground until the airflow over its wing is sufficient to produce "lift" and enable the machine to become airborne. This limitation naturally makes everyday flying impractical for the man-in-the-street who seldom owns a back garden long enough to provide a runway.

Now at last an aeroplane has appeared that satisfies Edison's requirements, for the helicopter designed by Igor Sikorsky can not only rise and descend vertically, but can fly backwards, hover, or be manoeuvred an inch at a time in any direction if necessary. It can take off from a space no more than 40 ft. square and can pull up in its own length from 30 m.p.h.

Sikorsky—a Russian—started his experiments with helicopters in 1910—but they would not get off the ground with a pilot so he turned his attention to orthodox aeroplanes instead, with considerable success. For instance, the world's first four-engined aircraft was built by him in 1913. He later set up shop in America and began to construct flying-boats and amphibians. To his credit go the first flights by standard transport aircraft across both the Atlantic and Pacific.

In 1939 the U.S. Army became interested in helicopters, and this gave Sikorsky the chance he had always hoped for. He got to work on a new

design and eventually the VS-300 appeared. It is not a handsome aeroplane. The forward part of the fuselage containing the single open cockpit is reasonably well-streamlined, but the rear portion consists of a "box-girder" of struts not even covered with fabric. At the end of this primitive-looking structure



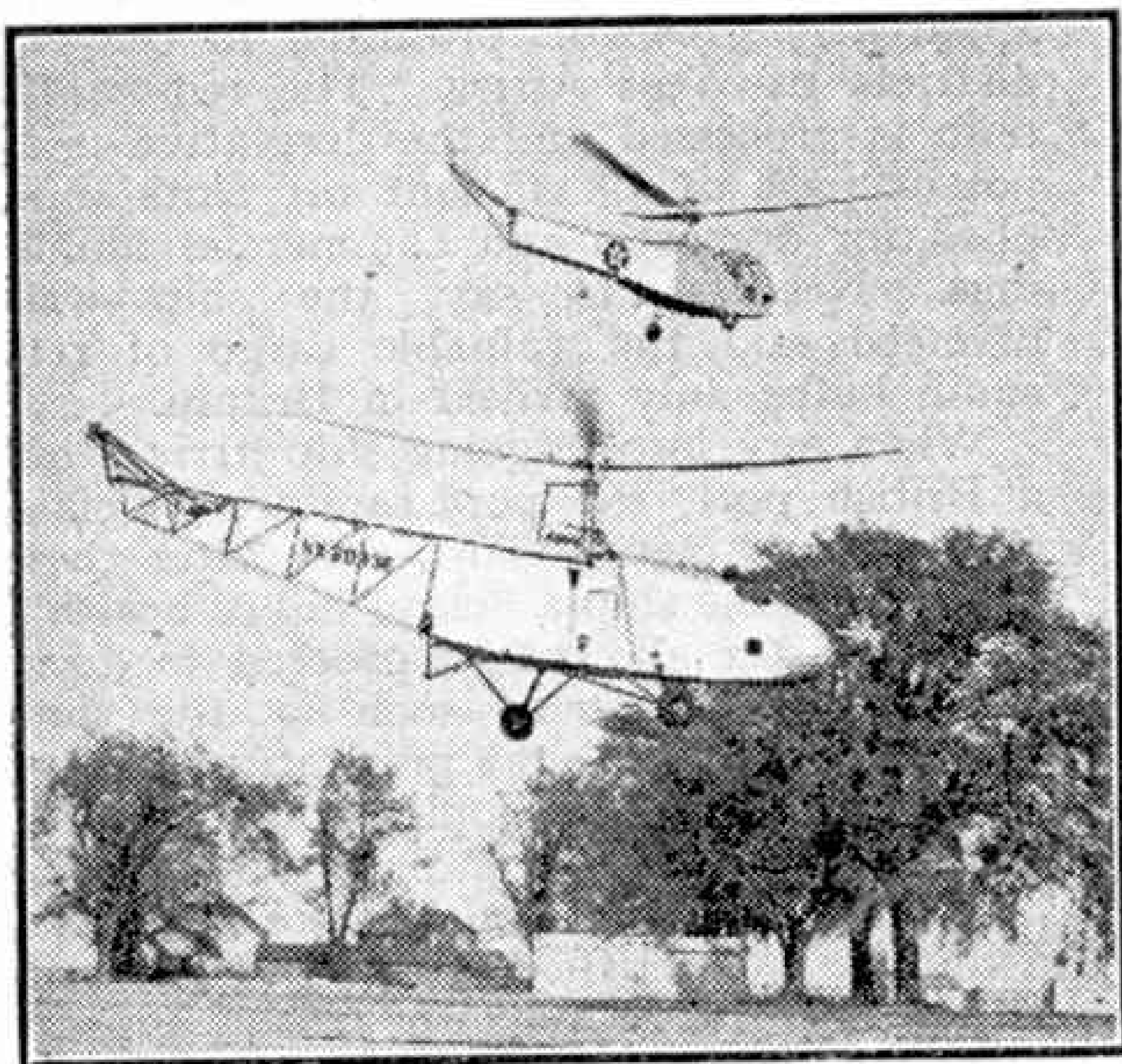
The Vought-Sikorsky VS-300 helicopter alighting on a row of packing cases.

is situated a secondary rotor which acts as rudder and counteracts any torque or "turning effect" set up by the main rotor. The latter is driven by a 90 h.p. Franklin engine housed in the fuselage, and has three blades, each 19 ft. long. These blades are shaped like wings, and consequently as they rotate they provide "lift" as does the wing of an orthodox aeroplane. As they are already moving through the air, forward run is not needed; and, at a certain speed of rotation, they give enough lift to raise the aircraft off the ground. The flying controls are simple and consist of the usual "stick and rudder bar" and an additional lever to the left of the cockpit.

To become airborne the pilot pulls back the left-hand lever which causes the machine to rise vertically like a lift. At the desired ceiling he pushes it forward again and the climb is stopped. To fly forward the "stick" must be pushed forward; in fact the aircraft goes in whichever direction the "stick" is pushed. Consequently, by pulling it backward the VS-300 flies backward—a most disconcerting experience at first for a pilot used to ordinary aeroplanes. If the "stick" is held in the neutral position the helicopter merely hovers. The rudder pedals control the pitch of the small rotor and thus assist turning. Pontoon floats that permit "landings" on either land or water may be fitted.

Sikorsky has since produced two further types of helicopter—the XR-4 and the YR-4—both with enclosed cockpits. The latter is in production, and experts foresee a great future for it for artillery spotting or anti-submarine patrol, where speed is not so essential as controllability.

But Igor Sikorsky hopes that it is as a runabout for the average man that the helicopter will benefit humanity, and predicts that one day helicopters will be more numerous than cars and much safer, as there are no narrow roads in the air, and the amazingly sensitive controls should make accidents almost non-existent. They will cost about £300 each and will do 12 miles to the gallon.



Two Vought-Sikorsky helicopters hovering in the air. The one in the foreground is the VS-300 and the other is the XR-4 two-seater machine.

War on the Rat

Preventing the Spread of Plague

By T. H. Elwell

PORT sanitary officials wage a constant war against rats on ship and shore with scientific methods, which have almost put the old type of "ratcatcher" out of business. The main concern is the detection and prevention of bubonic plague, a dreadful disease that still causes a high death rate in many foreign ports, for the bacillus or germ of this plague lives inside the fleas that are found in large numbers on both black and grey rats. The discovery that the rat flea was the "host" of this germ was made by bacteriologists only in the year 1894, although rats had long been suspected by many people to be disease carriers.

During wartime, controls of shipping are naturally more stringent than in normal years and the "War against the Rat" grows even fiercer. Apart from being carriers of bubonic plague, rats destroy and contaminate vast quantities of food annually, and food as a munition of war is as important as fighter planes or tanks. The Ministry of Food, in co-operation with the Ministry of Health, guards Britain's inland stores of bulk food, with methods and equipment adapted



Rats caught in a trap are allowed to escape—into the white linen bag in which they are taken away.

from the Port Sanitary Authorities.

Chemical baits or poisons for rats are not nearly so good as those produced from vegetables. In fact there was an interesting sidelight to the war effort a few months ago when official application was made to the Minister of War Transport by a group of manufacturers of rat bait for one ship to be diverted to a West African port to collect a cargo of red squill. This is a large bulb, rather like a lily bulb, which apparently grows in profusion in certain districts of West Africa. The red squill bulb is processed and the derivative is a potent part of all efficient rat baits supplied for domestic and commercial buildings. Needless to say, the ship was diverted and the valuable cargo of red squill bulbs duly arrived in Britain.

When any foreign-going ship arrives off a British port, the port sanitary officials are the first men aboard; only after they have given the ship a "clean bill of health" is the master allowed to proceed to dock or wharf. Almost as soon as the ship "ties up," both the rat preventive officers and the rat searching officers are the first men up the gang-plank.

The rat preventive officers are men with a lifetime's experience in the manners and habits of rats; modern Pied Pipers, although dressed in sober blue serge uniforms. Their job is to trap rats alive, for examination by bacteriologists in



An inspector shows the correct method of placing a rat guard on a mooring rope. This must be near the vessel, not at the shore end.

search of bubonic plague. The wire traps are baited with fresh cabbage leaves smeared with aniseed, toasted kipper or even cheese and jam! Contrary to popular



Tagging and labelling rats with details of the ship on which they were caught and the country from which it came. This information is necessary for tracing the source of any disease that might be detected.

belief, rats are fastidious feeders and very intelligent.

Often enough the officers draw a blank during the first search, but when a trap becomes "tenanted" by Mother Rat and family it is quickly immersed in a bath of paraffin oil. The paraffin bath kills both the rats and their fleas. The rats are then tagged and labelled individually with details as to the ship on which they were trapped, the country from which the ship sailed, and the nature of the cargo carried. This information is necessary for tracing the source of any disease.

Should the officers find a rat that has died, it is immediately suspect and rushed off to the laboratory for instant examination. Each year, in one northern port alone, over 10,000 rats are caught aboard ships, drowned in paraffin and dissected.

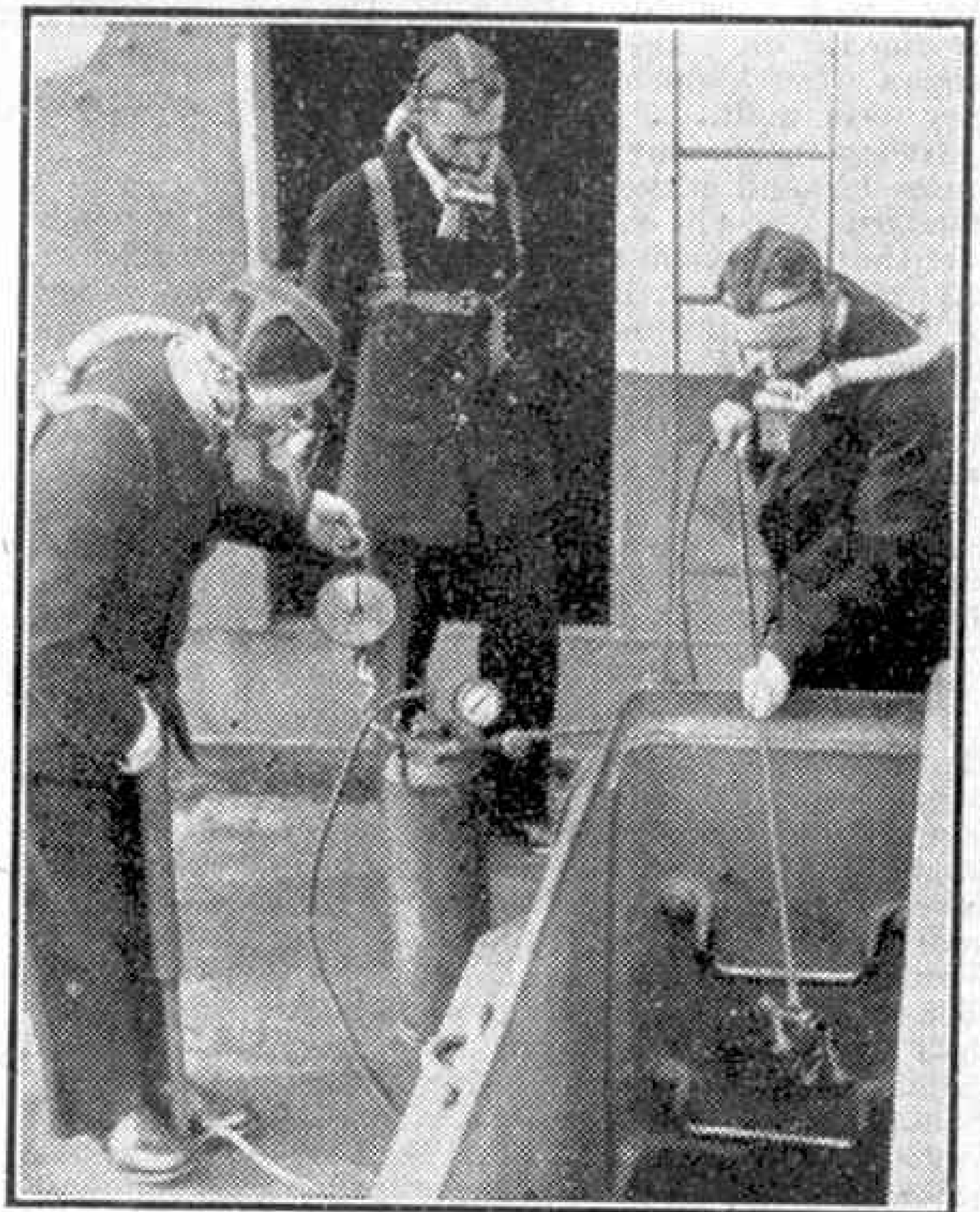
The rat searching officers examine the ship thoroughly for any further evidence of rats aboard from shore to ship. Metal rat discs should be placed by the ship's deckhands on all mooring ropes and hawsers, to prevent rats leaving or boarding the ship. Seamen often fix the discs haphazardly on the shore end of the hawsers. In such a position these are useless, as rats clamber down and have been known to leap 6 ft. and more off the hawser on the quay side. Inspectors look for these points and offer a friendly

word of advice to any greenhorns.

Freshly nibbled grain, gnawed timber and bitten lead water pipes give the searchers clues of the rats' whereabouts in galley and pantry. It is not uncommon to find a rat dead from the effects of lead poisoning, through sharpening its teeth on a galley lead pipe!

An international maritime law decrees that every six months every ship must be certified free from rats by a responsible Government Department. After the preliminary investigations are over, zero hour is set for a gas attack. Workmen seal all hatches and cabins and make them gas-tight in the approved Home Office A.R.P. Handbook manner. Picquets and warning notices are posted around the ship, and without a warning siren the officers don gas-masks and protective clothing.

A ship can be thoroughly "raided" from stem to stern in a few hours, with high-pressure atomisers that force the liquid used into a penetrating mist. This finds its way into every nook and cranny, killing the most cunning rat. It is a dangerous job for the gas-raiders, even when equipped with Service respirators, especially when hydrocyanic gas is used.



Spraying a hatch with deadly cyanide gas.

Railway News

L.M.S. Locomotive News

No. 6145, "*The Duke of Wellington's Regiment (West Riding)*" is another "Royal Scot" 4-6-0 to be rebuilt in the latest modified style. New class "5" 6 ft. 4-6-0 mixed traffic engines, of the series beginning at No. 5472 now under construction, are Nos. 5492-8 stationed on the Western Division. W.D. 2-10-0 freight locomotives, on loan, have lately been working up to Willesden on the West Coast main line, as well as over parts of the Midland section; they are numbered 36xx. No. 8500 standard "8F" 2-8-0, built at the Darlington Works of the L.N.E.R., is on loan to that company and operating in the Tyne-side area, where the similar No. 8510 built at Doncaster is also shedded.

Scrapping has begun of members of another well-known Scottish 4-6-0 type, in this case the "60" class introduced by the former Caledonian Company and developed after formation of the L.M.S. group to a total of 26 locomotives, numbered 14630-55 in the present lists. The last of these, No. 14655, has been withdrawn we learn, but actually this is one of the six forming the original batch turned out for the "Caley" in 1916 with 20 in. by 26 in. cylinders and 6 ft. 1 in. driving wheels having separate splashers. They were rather imposing looking engines when in the blue livery of the C.R., and they have usually remained on the section for which they were built.

Among their many duties far and wide, standard 2-6-4T engines sometimes work through over the exceptional distance for a tank locomotive of 115 miles between Swansea and Shrewsbury, along an extremely difficult route amid some of the magnificent scenery of Central Wales. There are many stops, of course, and water is probably taken several times. They may be assisted as pilot or banking engines by an ex-Midland 0-6-0, an ancient ex-London and North Western 0-6-2 "coal tank" or a Crewe 0-8-0 perhaps; all of which are in very marked contrast as regards age, appearance and design to the modern Stanier 2-6-4T class.

Southern Tidings

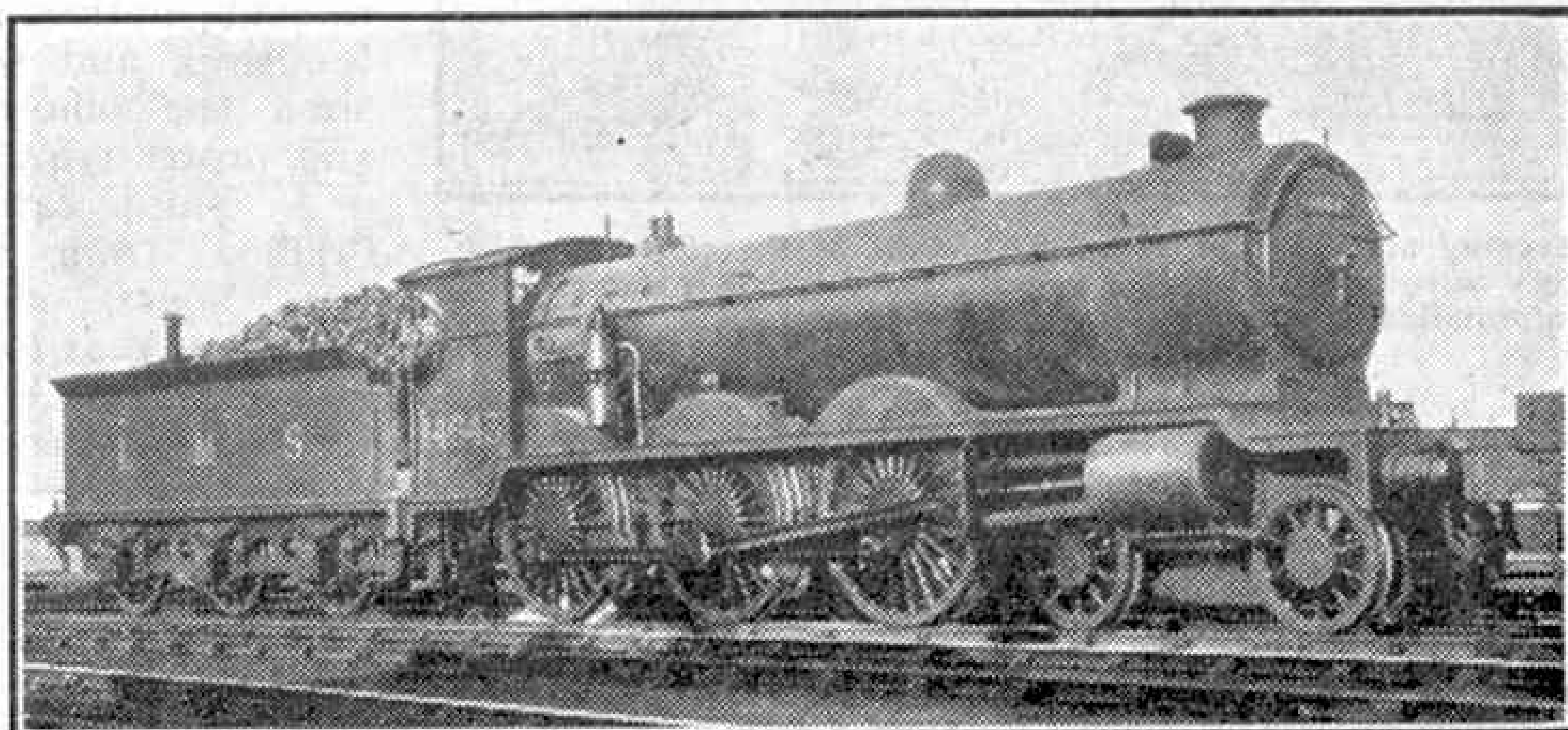
Two "T" class 0-6-0Ts of the erstwhile London, Chatham and Dover passenger type, though actually built as part of a group of 15 by Messrs. Sharp, Stewart and Co. in 1900, a year after the working amalgamation with the South Eastern Company, have recently been seen on empty carriage shunting between Waterloo and Clapham Junction on the Western main line. Their numbers are 1606 and 1608. On the same line there are also some "H" class standard 0-4-4Ts of the joint S.E. and C. slightly larger design, on duties that used to be monopolised by the familiar Drummond London and South Western tanks of the same wheel notation, which have now largely been moved into the country.

Mixed traffic 4-6-0 engines of the "H15" and "S15" series have been seen on Exeter-Exmouth

branch goods workings, at any rate over part of the route. It is understood that 30 new British W.D. 2-8-0s of the "Austerity" Ministry of Supply type, numbered 74xx, are now working on the Southern system, quite a number being on the Eastern section operating from London sheds. This is the second time that 8-coupled tender locomotives have been allocated to the former South Eastern and Chatham metals. The first time this occurred was just after the last war, the engines then involved being the R.O.D. 2-8-0s built for Government purposes to the Robinson Great Central design. As already noted, there are some U.S.A. freight engines on loan to the Western Division, where the British "Austerity" locomotives of the same wheel notation are also appearing.

One was reminded of years gone by by seeing an up Dover and Folkestone express weighing nearly 400 tons full leaving Tonbridge round the curve on to the Sevenoaks climb headed by two 2-cyl. 4-4-0 engines in full cry. These were "L1" No. 1784 piloted by "D1" rebuild No. 1545, the whole making quite an impressive wartime sight.

We are informed that the only Kent and East Sussex Railway locomotive to be seen at Rolvenden during the past winter was No. 4, under repair.



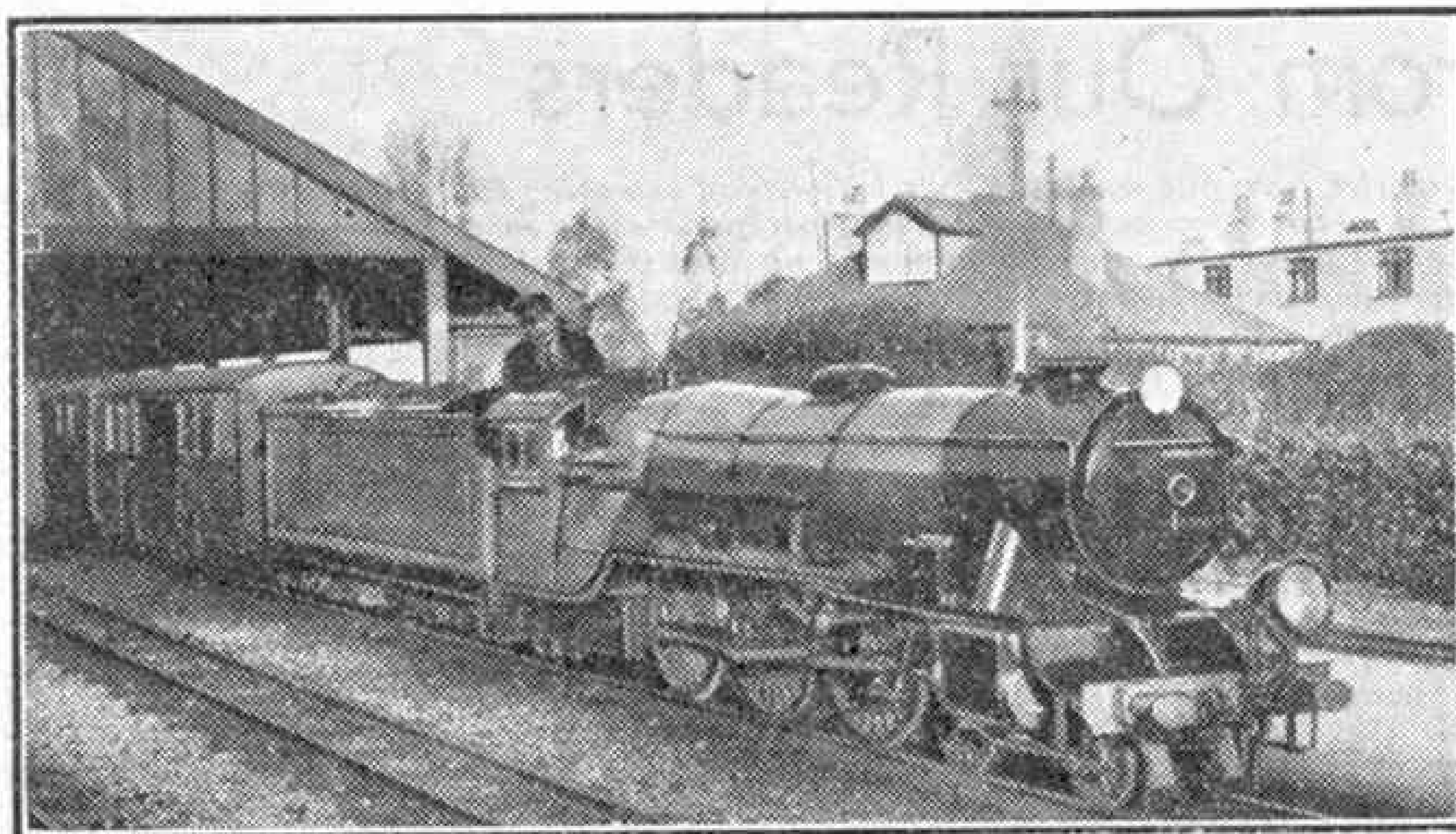
L.M.S. "4P" No. 14643, one of the Caledonian "60" class, designed by Pickersgill and built in 1925. A special reference to these locomotives is made on this page. Photograph by G. R. Grigs.

This is one of the 0-6-0 saddle tanks built over 60 years ago for the former London and South Western with 4 ft. driving wheels and originally numbered 335; then on the duplicate list it became 0335.

Among interesting facts officially announced in the "*Southern Railway Magazine*," we read that the company's peacetime traffic mileage was made up of 70-75 per cent. passenger and 25-30 per cent. freight; now the proportions are about 50-50, and there is much additional goods and special traffic along unaccustomed routes. Nevertheless, as regards actual numbers of passengers travelling it is estimated that as on other lines the present volume is at least 60 per cent. in excess of the all-the-year-round pre-war average, although passenger train mileage has been reduced by 30 per cent. compared with 1938. Coal consumed by S.R. engines comes from Wales to the extent of approximately 45 per cent.; from Notts. and Derbyshire 15 per cent.; from Yorkshire 15 per cent.; and from Kent, 25 per cent.

The Romney, Hythe and Dymchurch Railway

This fascinating little 15-inch gauge line, which many readers will remember with pleasure, has been closed to ordinary passengers for more than three years, as it is situated in the front line close to the south-east coast of Kent, where visitors are not allowed. Some of the "Pacific" locomotives have however been at work as required by the military authorities, and it may now be revealed that when



"Blue Bottle" and blue train on the Romney, Hythe and Dymchurch Railway.

attempted invasion was expected in 1940, an armoured train was operated along the miniature tracks, probably on the most diminutive wagons that have ever carried guns or small arms in the world's railway history.

There are five "Pacific" engines modelled on the Gresley "A1" type, though with two cylinders. They are named "Green Goddess," "Northern Chief," "Southern Maid," "Typhoon" and "Blue Bottle." The last of these was renamed from "Hurricane" and painted blue just before the outbreak of war. Two other 4-6-2s are "Black Prince" and "Doctor Syn," which followed a Canadian design of years ago; one of these appeared for some time painted bright red.

The giants among the locomotive stock of the line were two powerful 4-8-2 passenger engines, of which one remains, No. 5 "Hercules." The usual locomotive colour is green, with green and cream for coaches and vans. May it not be long before normal operations can again be resumed on this bantam railway!

More Variety Than Ever!

The railway geography of the area has for a long time resulted in a considerable variety of locomotive classes, and present or former owners, being observable in the Heaton Mersey-Stockport districts, near Manchester. A resident there reports that wartime conditions have greatly intensified such interest, and that in the course of a week on the Midland (L.M.S.) and Cheshire Lines Joint tracks (operated mainly by the G.C. section, L.N.E.R.) he noted nearly 30 distinct locomotive types at work, including the following: L.N.E.R. "Sandringham," G.C. "B7" and "B9" 4-6-0 classes; "K3" 2-6-0s; L.N.E.R. "J39," G.N. and G.C. type 0-6-0s; G.C. 0-8-0s; G.N. and G.C. 2-8-0s; and G.C. 4-4-0s large and small, as well as tank engines. L.M.S. standard 4-6-0 express passenger and mixed traffic locomotives came along, as well as 2-6-0s, 2-6-2Ts and 2-6-4Ts, 0-6-0s of Lancashire and Yorkshire as well as Midland origin, Crewe 0-8-0 freight engines, the last remaining "Claughton" 4-6-0, and new British "Austerity" W.D. 2-8-0 locomotives. Last but not least came an ex-Great Northern "Atlantic."

One and a Half Million Shell Containers

Although the use of paper is much restricted and newspapers collected from trains are now much

smaller in size, no less than 3,297 tons of paper were collected by L.M.S. staffs during last year. This brings the total of waste paper collected on the company's property in four years to 13,000 tons, enough to produce nearly 1½ million 4.5 A.A. shell containers!

Early Railway Enterprise

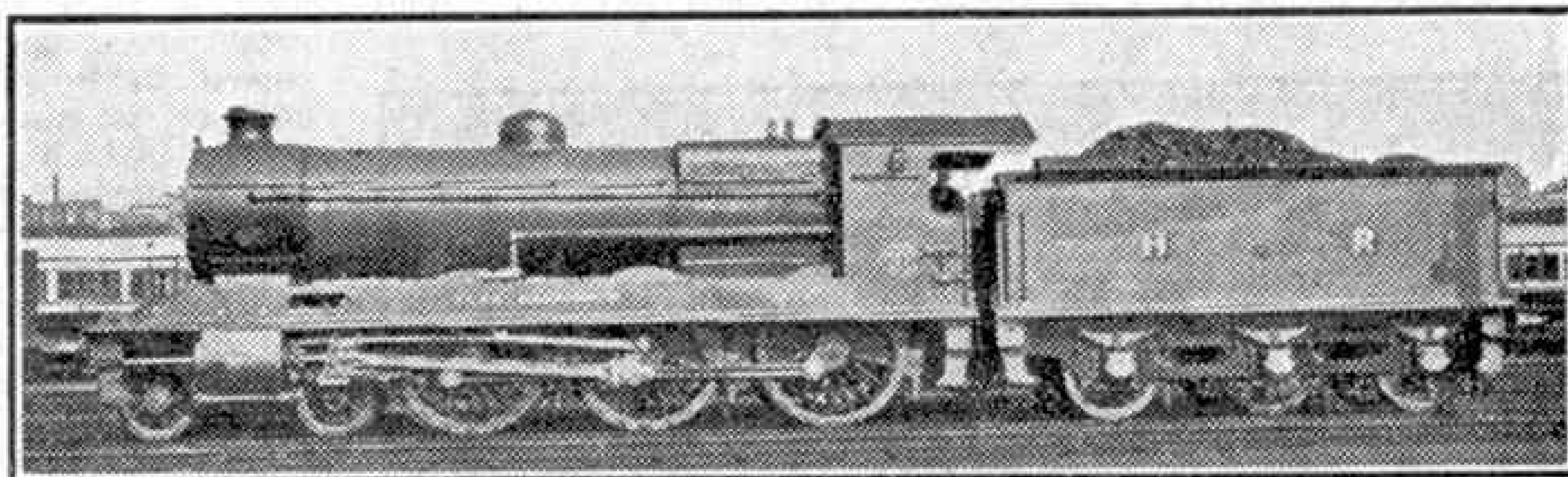
An advertisement of the early days of railways in Scotland has recently been brought to light in an L.N.E.R. office in Glasgow. This was exhibited by the original Edinburgh and Glasgow Railway, later acquired by the former N.B.R., which became a constituent company of the L.N.E.R. It is addressed to builders, informing them that "parties who may

build villas within a mile of any of the Stations on the line, not being Town Stations," would be granted Free Tickets according to the "certified cost of the Villa." A person building a house costing a minimum of £500 was entitled to a free ticket for each additional £100 paid for the house. The tickets were transferable to a yearly tenant, if the house was not occupied by the owner.

It is not known how many people availed themselves of the generous offer, or the exact period in which it was made, but the Edinburgh and Glasgow Railway began working in 1842 and was taken over by the North British Railway in 1863.

L.M.S. Southend Traffic

In August last we illustrated and described the 4-4-2 tank engines that for so many years operated the busy passenger traffic to and from Southend-on-Sea on the former Midland (London, Tilbury and Southend) line, and which in a modernised form are carrying on to-day. It is interesting, therefore, to quote some outstanding figures announced officially about 10 years ago, at the time of the arrival of 3-cyl. 2-6-4T locomotives, which broke the unique continuity of 4-4-2T haulage. There were 12,000 season ticket holders in the Southend area, the majority travelling to London between 8 and 10 a.m., and returning between 5 and 7 p.m. Ten trains were operated over the 36 miles to Fenchurch Street (City)



L.M.S. "4P" No. 14767 "Clan Mackinnon," in its former Highland Railway livery. As announced in the April "M.M.," the first "Clan" withdrawal for scrapping has taken place.

between 8 and 9 a.m., loads ranging from 11 to 13 bogie coaches, with a maximum tare weight of 334 tons, representing about 370 tons full.

Approximately 2½ million tickets per annum were collected in peacetime at the six stations within the Southend region. On a fine Bank Holiday evening 60,000 to 70,000 visitors have been conveyed home to stations in the London area, including the Midland, North London and District (L.P.T.B.) lines.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

SNOWDON MOUNTAIN RAILWAY

Mountain railways are usually associated with Switzerland and abroad, but we have one mountain rack railway in Britain, that climbing Snowdon Mountain. It was constructed in 1896 and normally operates from Easter, when snow permits, to October.

The railway starts from Llanberis and climbs to the summit of the mountain, a distance of nearly five miles. The journey takes about an hour, thus giving the passengers in the open observation carriages opportunities of viewing the magnificent scenery around this area from many angles.

The locomotives were built specially at Winterthur in Switzerland, and are designed for power, not speed. To ensure perfect safety the carriages are pushed in front of the engine and are not coupled. Thus, if the engine ran away, the carriages would be stopped instantly by the automatic brakes. The rails merely serve the purpose of bearing the weight and guiding the trains. There is a double central rack with wide teeth and the engines have central wheels with deeply indented teeth that engage on those of the rack and so provide the drive. The gauge is 2 ft. 7½ in.

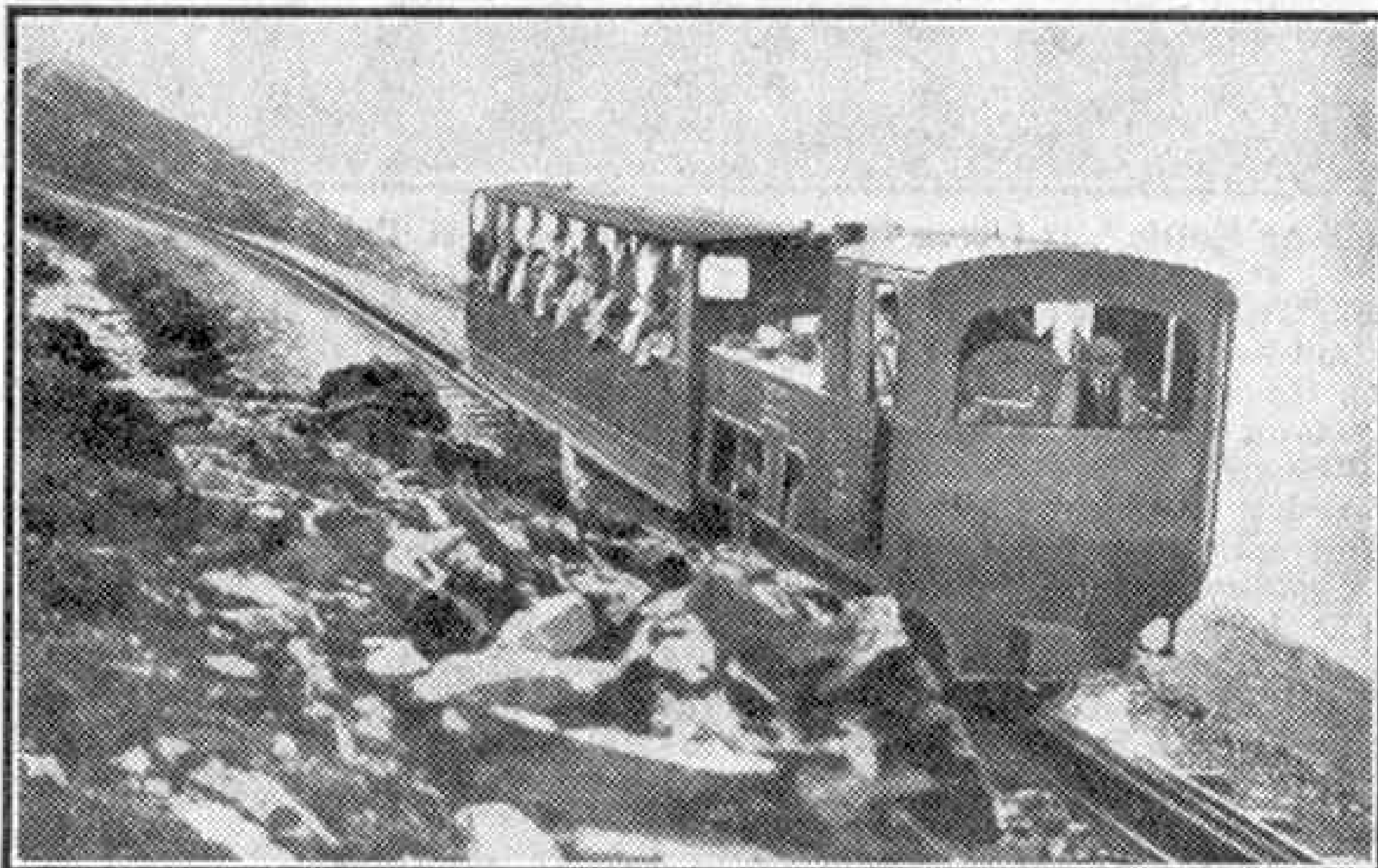
The peak of Snowdon is 3,560 ft. above sea level, and on a clear day a magnificent panorama is obtained from the summit. A corner of Scotland, the Wicklow Mountains of Ireland as well as the nearer surrounding peaks of the Welsh Mountains can be seen on the clearest of days, but it is far more fascinating just to be above the shifting, rolling clouds and to see them open from time to time, revealing marvellous pictures of land, sea, lake and mountain.

R. CHARLES (London N.W.2).

SOUTH AFRICA'S LARGEST CREAMERY

Right in the heart of the Orange Free State is the

little town of Senekal, one of the most important of the farming centres in that province. The town has the honour of possessing the largest creamery in South Africa. This is run on a co-operative basis, that is the farmers are actually shareholders in it. The Government subsidises all such ventures, and thus



The Snowdon Mountain Railway, with a locomotive and car descending. Photograph by R. Charles, London N.W.2.

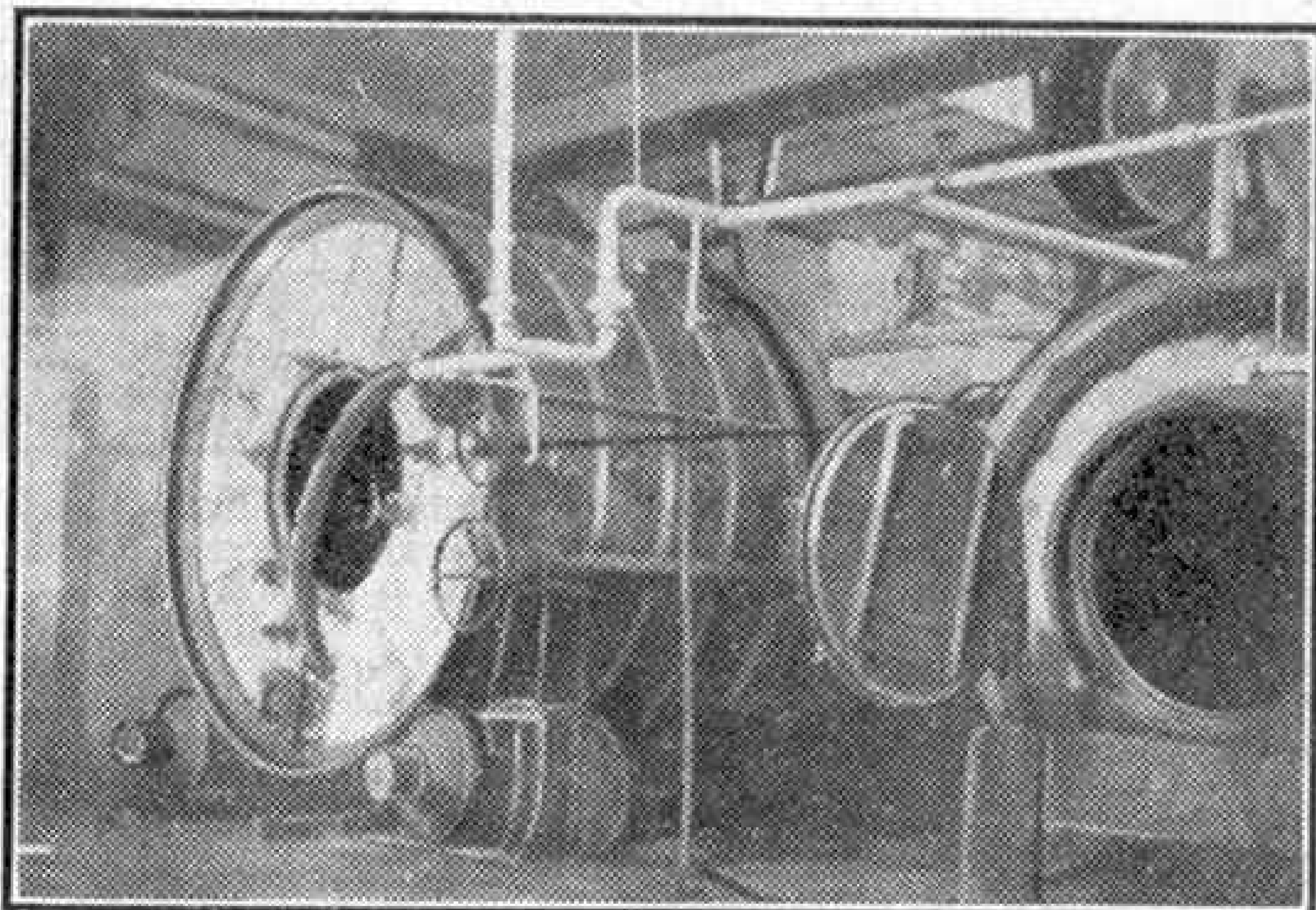
encourages the farmers to take these progressive steps, in this way raising the standard of South African agricultural products.

When a farmer brings his cream to the creamery, it is weighed and tasted by a skilled grader, who thus roughly judges the standard. It is then tested by accurate analytical methods, after which all the cream that has been brought in is poured through fine screens into large baths, where, by means of slowly revolving pipes with water circulating through them, it is warmed or cooled to the requisite working temperature, which varies with the season of the year.

The cream is then pumped into large wooden vats, where salt is added, and thoroughly stirred in by machinery. From here the mixture is pumped into large cylindrical churns, which are rotated by revolving wheels pressed tightly against iron bands on their rims. Small glass inspection ports allow the progress of the churning to be watched, and when butter is finally produced, the machinery is stopped, and the butter withdrawn by means of wooden spades.

The butter is removed to the packing department, where it is fed into a machine that ejects it in two continuous strips, with a cross section of about 4 in. by 3 in. A wire grid operated by hand cuts these strips into the familiar 1-lb. slabs, which are wrapped by hand and removed to the cold storage room, an underground cellar lined with pipes through which a freezing mixture is pumped. In summer, when cream is plentiful, 10,000 to 12,000 lb. of butter are stored here per day. This is later taken by lorry to the station, from which it is sent to various parts of South Africa in special refrigerator vans.

I. BENJAMIN (Germiston).



Churns for butter making in South Africa's largest creamery. Photograph by I. Benjamin, Germiston, Transvaal.

Photography

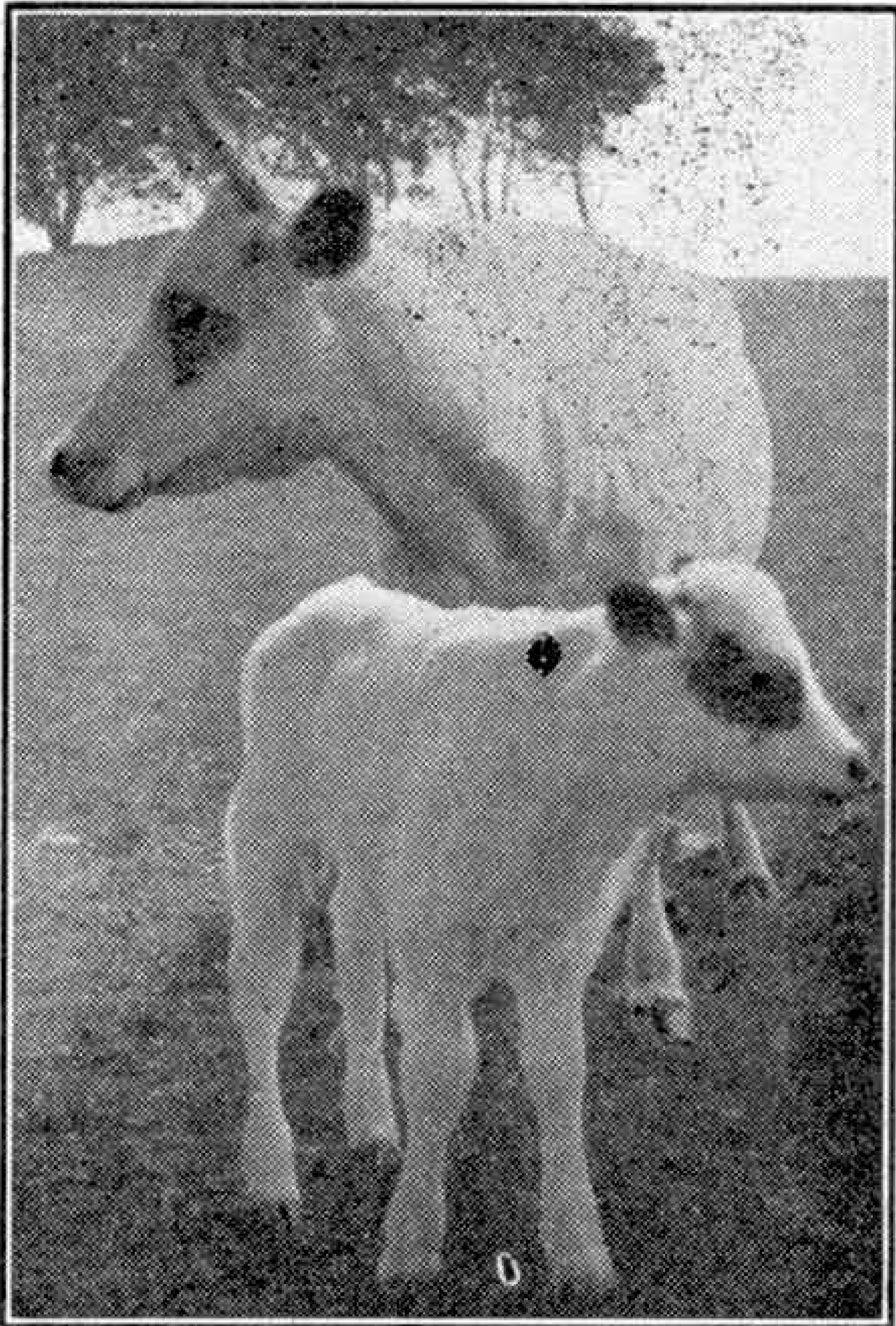
A Few General Hints

perfectly straight, otherwise you will have trouble with the film later on. Finally, wind on the film *immediately* after each exposure. Neglect to take this advice always results sooner or later in two pictures on one piece of film, and this usually happens with pictures that are of special interest.

Films are scarce these days, and more than ever is it important to avoid failure due to bad mistakes in exposure. The simplest way of dealing with this exposure business is to make use of an exposure calculator. Spend a shilling on the "Wellcome" exposure guide in its wartime form. It contains a remarkably simple and efficient calculator, with full and up-to-date lists of plate and film speeds, in addition to valuable advice on developing your own films.

Holding a camera perfectly steady in the hand is not as easy as it appears. To be on the safe side do not attempt an exposure of longer than one twenty-fifth of a second without resting the camera on a solid support of some kind.

Do not expect your camera to do impossibilities. If the fastest speed of your shutter is marked $\frac{1}{100}$ of a second, which actually is likely to be a good deal slower, leave rapidly moving objects severely alone. They are not for you. There are plenty of interesting subjects that either keep still or move at a reasonable speed.

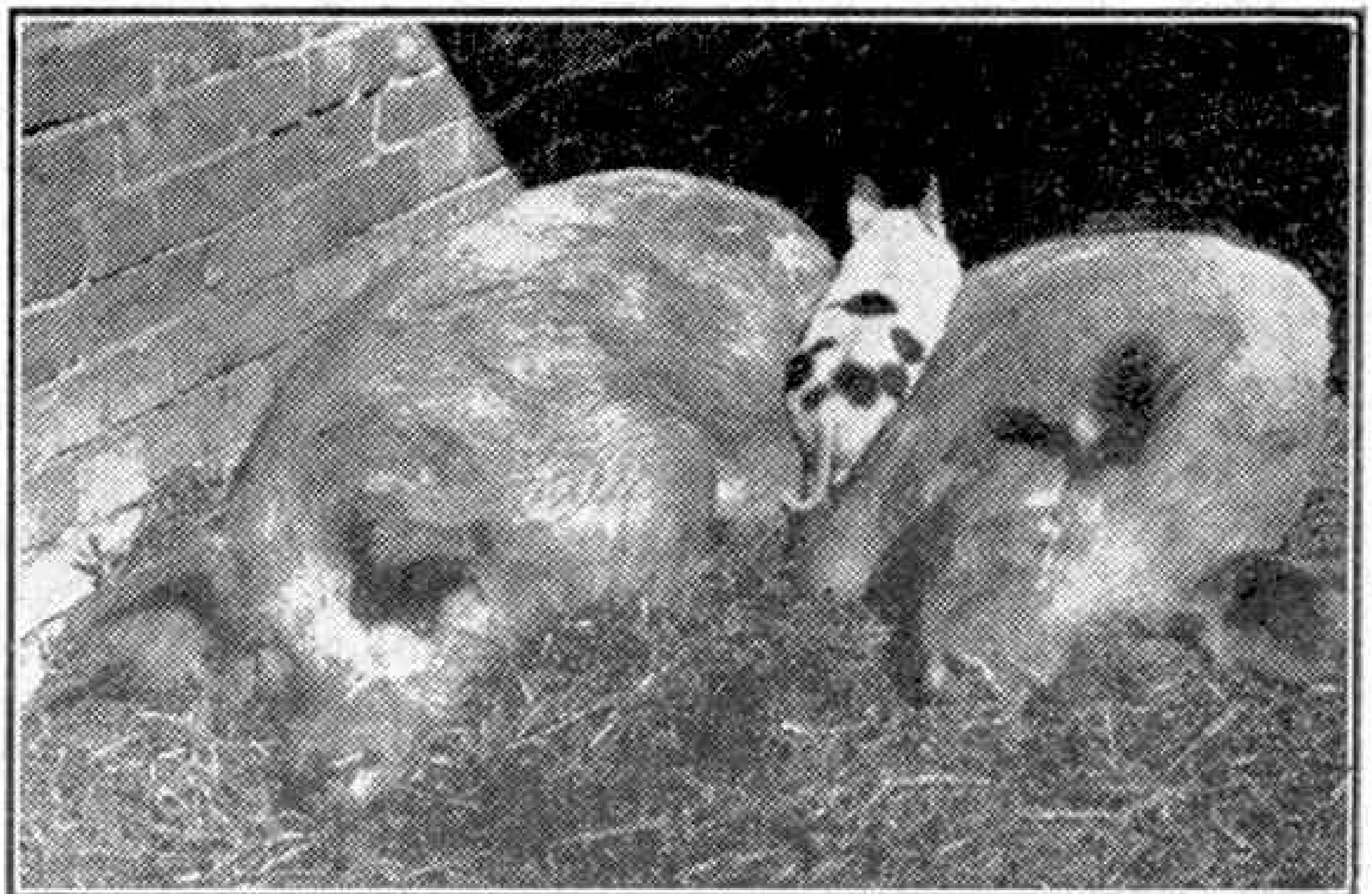


"We are not amused!" Photograph by I. Alexander, Glasgow.

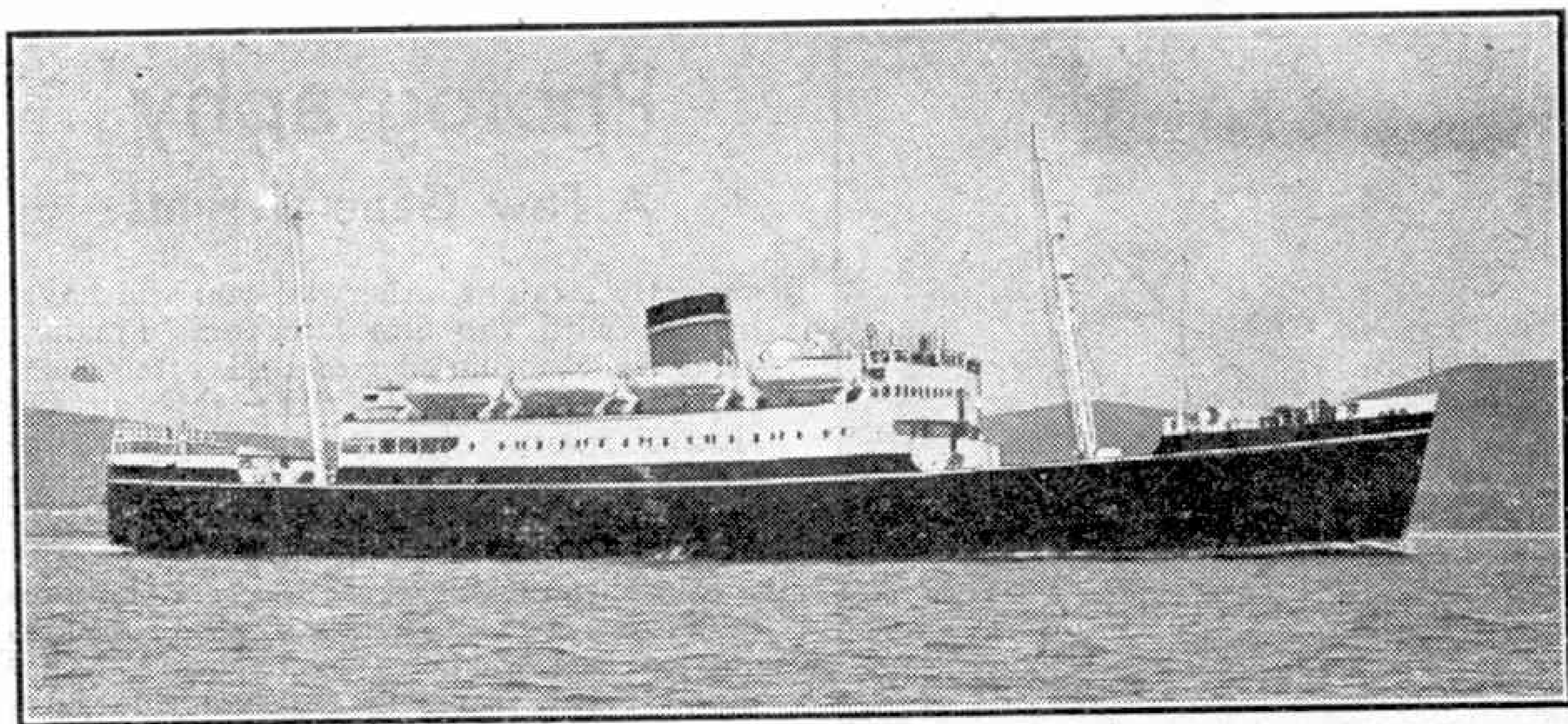
AT this time of year every owner of a camera begins to feel the desire to snap something; and if he can get a film—sometimes a big "if"—he sets to work. Often the results are disappointing for the simple reason that the photographer treats the whole affair too carelessly. A few practical hints and reminders therefore may be of help.

First of all see that your lens is clean; dust and greasy finger marks are real trouble-makers. Wipe the lens gently with a clean and soft silk handkerchief or some similar soft material.

Do not load or unload a spool of film in bright sunlight. The films are packed for daylight loading, but there is no need to put them to the extreme test of brilliant sunshine. If you are out in the open, shade the camera with your body. After you have inserted the tapered end of the protecting paper of the new film into the wide slot of the empty spool, take care that the paper winds on



"Warming up!" Photograph by E. E. Steele, Lincoln.



H.M.S. "Royal Ulsterman"

By Denis Rebbeck, M.A. (Cantab.), A.M.I.Mech.E.

IT is quite natural in wartime, especially at the commencement of hostilities, that some ships are called upon to carry out duties far removed from their natural routine work. Fishing trawlers and drifters, almost overnight became armed trawlers and minesweepers. Pleasure steamers from the Clyde and the South Coast were quickly converted to minelayers and sweepers.

An extremely interesting war record has been compiled by the well-known cross channel ship M.V. "Royal Ulsterman" belonging to the Burns and Laird Lines and built by Harland and Wolff Ltd., at Belfast, for the Glasgow-Belfast express night service between Scotland and Northern Ireland. This handsome vessel was built in 1936, and soon became a very popular ship to all travellers on her particular route. When war came, the Admiralty took the ship over, and a brief account of her war service reads like some adventure story. In the short space of 3½ years she has become a famous veteran.

The "Royal Ulsterman" took part in the Norwegian campaign in 1940; the evacuation from France in the same year, the Salerno landing, and the North African landings; she was present at Sicilian and Italian landings; has carried over 25,000 troops and has sailed over 70,000 miles on operations. She has had a period as a troopship steaming to Iceland, as well as being a troopship on the West African coast. She carried repatriated French troops to L'Orient, evacuated civilians from Gibraltar, and carried troops from Iceland

to the Gold Coast and South Africa. Her officers and crew have earned several decorations, including three D.S.C.'s and four D.S.M.'s.

At one time the "Royal Ulsterman" was sailing as one of the of the famous "Moonlight ferry squadron," when she carried 18,000 troops and supplies along 12,000 sea miles on the North African coast. She took R.A.F. personnel to the Gold Coast and also had a share in the Pantellaria operations.

Other important jobs which this famous little vessel did in her daily round included the assault on the island of Madagascar, and a "hell" of 14 hours at Haastadt, when she was bombed by German aircraft. She also has to her credit the shooting down of two enemy planes for certain, together with some probables.

The "Royal Ulsterman" is 327 ft. 7 in. in length, has a beam of 47 ft. 6 in., a depth of 17 ft. 9 in., and a gross tonnage of 3,250. She is engined by two eight-cylinder, Harland-Burmeister and Wain single-acting two cycle Diesel engines, developing 5,500 brake horse power, and her pleasing lines can be gathered from the accompanying photograph. It is no overstatement to say that she is a vessel of which her owners, her builders and her country may well be proud. May the wish be expressed that it will not be long before this gallant little vessel is employed once more on her regular run between Scotland and Northern Ireland, and in the meantime good luck to her and her crew.

Two Useful Mechanisms

By "Spanner"

will with gears in the gear-box. The Pinion must be so adjusted for height that it meshes with the Gear Ring attached to the travelling base.

A Neat Crankshaft

Our second mechanism, shown in Fig. 2, is a neat triple-throw crankshaft with two bearings. The crank webs are constructed by screwing the head of a grub-screw into one of the holes of a Collar so that one half of its shank is left projecting beyond the surface of the Collar. A second Collar is then screwed on to the shank of the grub-screw and tightened up so that both Collars are secured

firmly. The centre web portion consists of two Collars secured by grub-screws to a "spider" removed from a Swivel Bearing, so that they are at right angles to one another. Grub-screws inserted in the remaining tapped holes of the various Collars serve to secure in place the crankpins and journals of the crankshaft. The connecting rods consist of Screwed Rods that are partially inserted in the grub-screw holes of Collars that turn freely on the crankpins.

It is not difficult to devise similar crankshafts to suit models for which a triple-throw mechanism is not required, and the method is a novel one that will often be found useful by readers who specialise in building model engines.

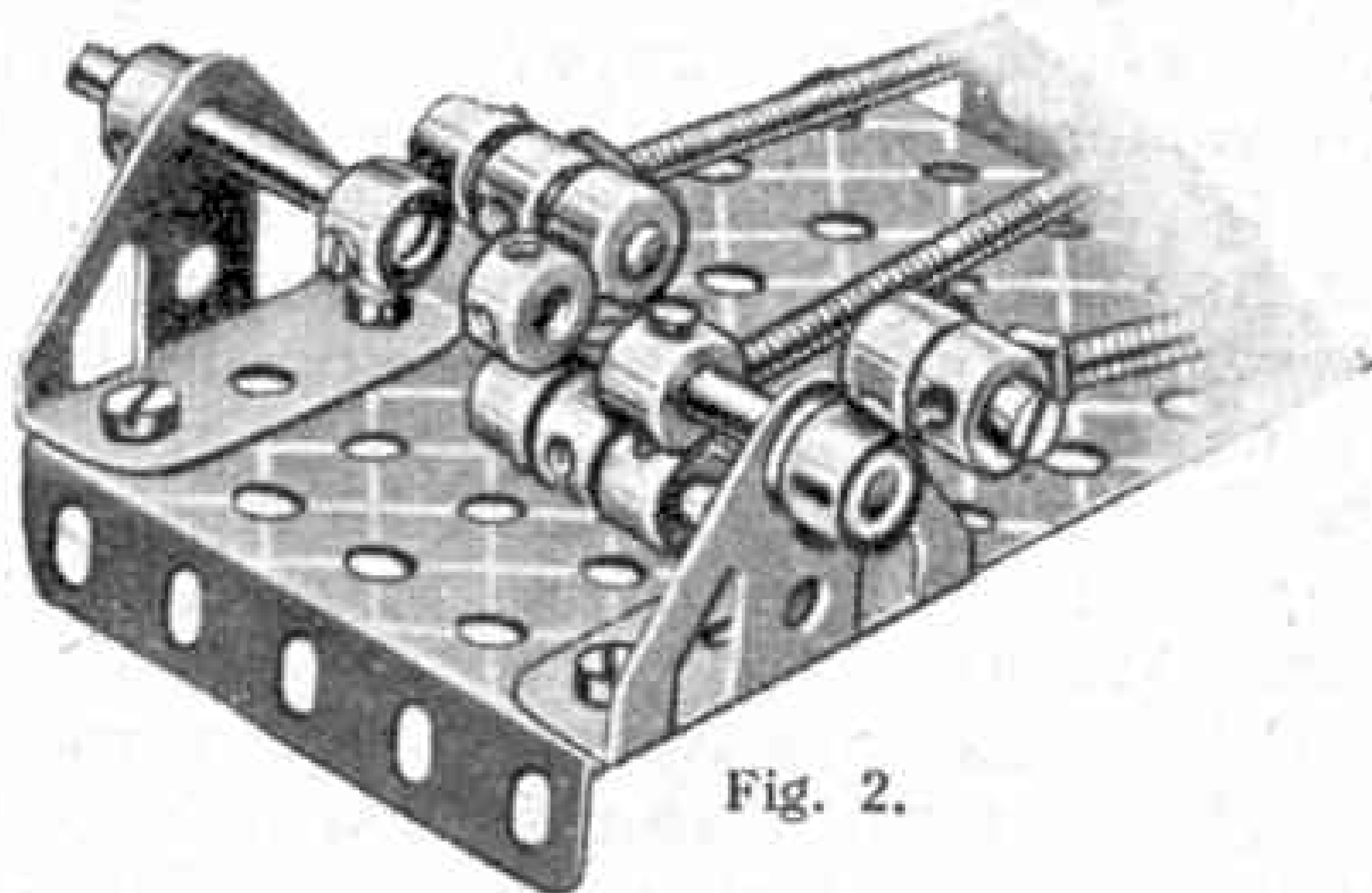


Fig. 2.

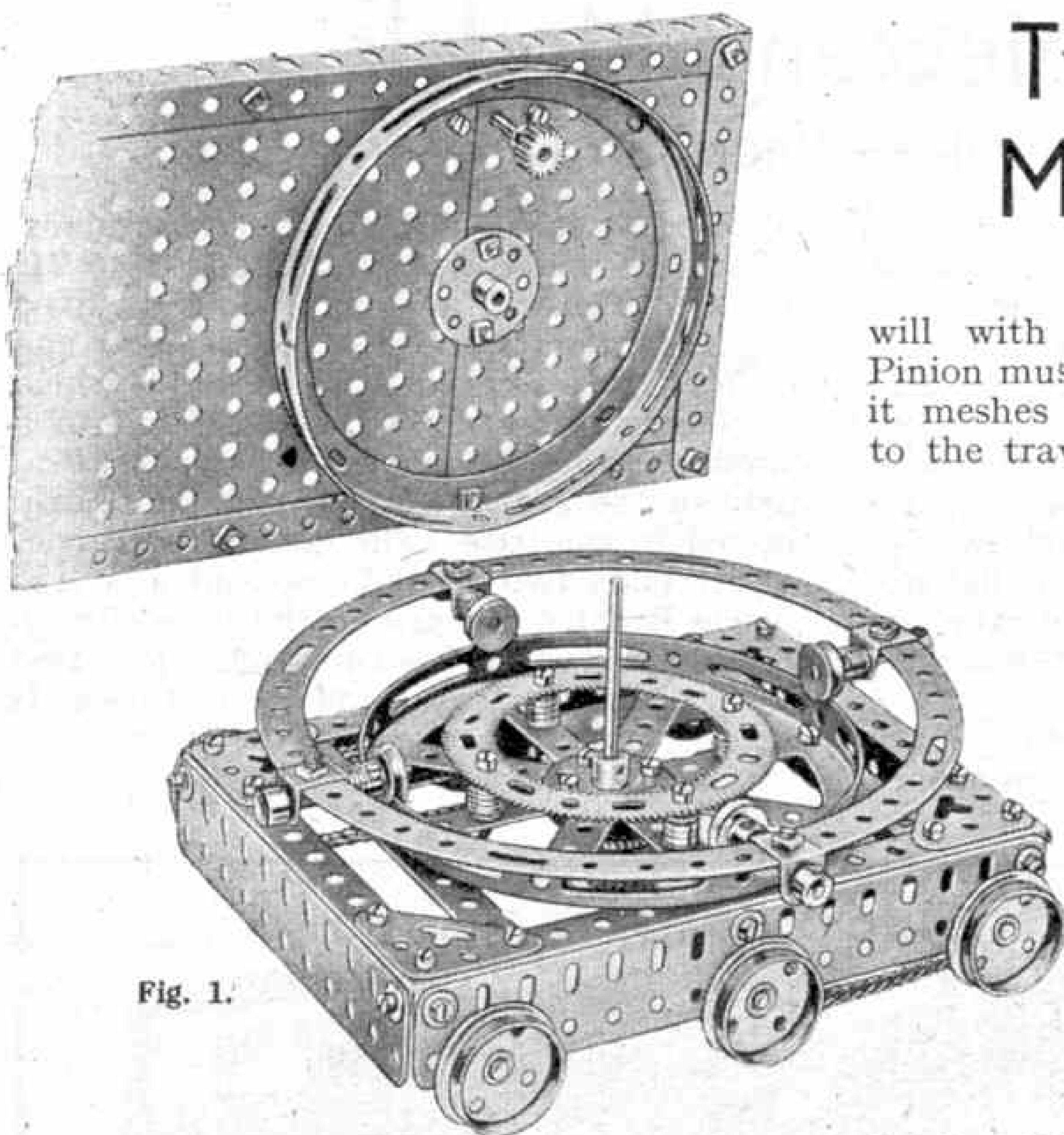


Fig. 1.

A Built-up Roller Race

On this page we illustrate and describe two Meccano mechanisms that should be found useful by many model-builders. The first is a built-up roller race. For models of medium size the Ball Bearing unit often is too small and the Roller Bearing is too large. In these cases this built-up bearing of intermediate size is just the thing. It is shown in Fig. 1. The bottom fixed race consists of a Hub Disc held in place by four nuts and bolts. A Bush Wheel without its grub-screw is bolted in the centre of this Hub Disc to form one bearing for the centre Rod.

A Gear Ring, shown in the illustration, is now secured in place by means of four $\frac{3}{4}$ " Bolts, each of which carries eleven Washers on its shank for spacing purposes. The ring frame consists essentially of a $7\frac{1}{2}$ " Circular Strip, which is fitted at four equidistant points round its edge with rollers, consisting of $\frac{1}{2}$ " fast Pulleys on $1\frac{1}{2}$ " Rods.

The upper race of the roller bearing consists of a Circular Girder that is bolted directly to the base of the revolving superstructure. Slewing is carried out from a $\frac{1}{2}$ " Pinion secured on the lower end of a Rod, a gear on the upper end of which can be engaged or disengaged at

New Meccano Models

Cakewalk—Wheelbarrow

THE amusement machines seen in fairgrounds make interesting subjects for Meccano models and one of the most popular of these is the cakewalk, a simple model of which is shown in Fig. 1. The model is designed for Outfit No. 5, and construction is commenced with the base frame. Two $12\frac{1}{2}$ " Angle Girders 1 are extended 2" at their front ends by $5\frac{1}{2}$ " Strips that are bolted to their flanges, the free ends of the Strips being attached to $12\frac{1}{2}$ " Angle Girders 2. Across the corners of the frame $5\frac{1}{2}$ " Strips are bolted.

There are two oscillating gangways, each of which consists of two $12\frac{1}{2}$ " Strips spaced apart by two $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " and a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate overlapped and attached to the $12\frac{1}{2}$ " Strips by $\frac{1}{2}$ " \times $\frac{1}{2}$ " Angle Brackets. These Strips are also bolted by $\frac{3}{8}$ " and $\frac{1}{2}$ " Bolts to $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips, $2\frac{1}{2}$ " Strips and $2\frac{1}{2}$ " Cranked Curved Strips at each end. The $2\frac{1}{2}$ " Strips and $2\frac{1}{2}$ " Cranked Curved Strips are bolted to $12\frac{1}{2}$ " Strips forming the handrails, and the rear end of each gangway is enclosed by a large radius Curved Plate. The gangways are completed by bolting $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates and $1\frac{1}{4}$ " Discs to their sides.

The gangways are mounted on pivoted legs, which are set in motion by turning a handwheel and impart an oscillating movement to the gangways. Each leg is a $2\frac{1}{2}$ " Strip, which is pivotally attached at its upper end to the gangway and at its lower end pivots on a $3\frac{1}{2}$ " Rod held in the arms of a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip bolted to the base. Short lengths of Cord threaded between the pairs of Strips form stops.

The model is operated by turning a handle 3 formed from a Bush Wheel to which is attached a Threaded Pin. The Bush Wheel is mounted on one end of a

5" Rod 4 journalled in two Trunnions, which are bolted to $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " and $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plates 5 and 6 respectively fixed to the Girders 1 and 2. On the other end of Rod 4 is secured a $1\frac{1}{2}$ " Pulley, which is connected by a 6" Driving Band to a similar Pulley 7 mounted on a 2" Rod held in the arms of a Cranked Bent Strip bolted to the base. The latter Rod carries at its ends two 1" Pulleys, and a $\frac{1}{2}$ " \times $\frac{1}{2}$ " Angle Bracket is fixed to the boss of each of these. Two $5\frac{1}{2}$ " Strips are lock-nutted to the Angle Brackets and their other ends are pivotally attached to the inner sides of the gangways.

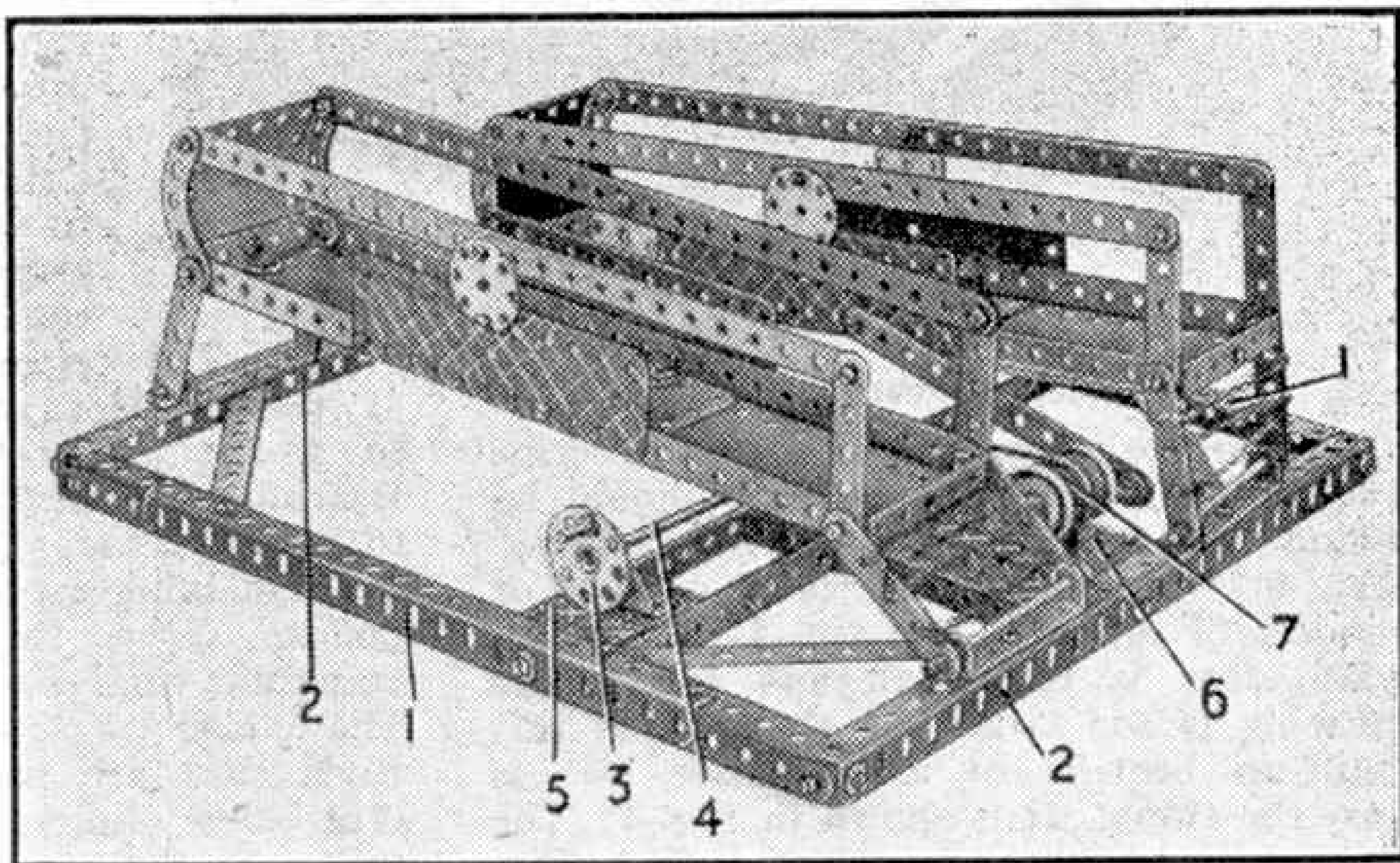


Fig. 1. Fairground fun in Meccano. A realistic cakewalk model that is easily constructed and will provide great amusement.

Parts required to build model Cakewalk: 9 of No. 1; 10 of No. 2; 2 of No. 3; 12 of No. 5; 4 of No. 8; 12 of No. 12; 2 of No. 12a; 1 of No. 15; 4 of No. 16; 1 of No. 17; 4 of No. 22; 1 of No. 24; 12 of No. 35; 91 of No. 37a; 71 of No. 37b; 14 of No. 38; 1 of No. 40; 1 of No. 44; 1 of No. 48; 8 of No. 48a; 1 of No. 51; 1 of No. 52; 4 of No. 90a; 2 of No. 111a; 6 of No. 111c; 1 of No. 115; 2 of No. 126; 1 of No. 186a; 4 of No. 189; 2 of No. 191; 4 of No. 192; 2 of No. 220; 1 of No. 217a.

Fig. 2 shows a miniature and realistic model wheelbarrow, the construction of which provides an interesting pastime for young model-builders. It is built around two $3\frac{1}{2}$ " Crank Handles 1, with Erinoid Grips. These are spaced apart by Couplings fitted in the positions shown, the cranks of the Crank Handles being turned outwards. Before the Couplings are fitted, however, two Collars 2 should be placed

on the Handles to provide attachments for the legs. These are formed from $1\frac{1}{8}$ " Bolts, and two of the Couplings are then placed on the Crank Handles. The bearings for the wheel consist of two Collars, one mounted on each Crank Handle and fixed as shown by means of Threaded Pins 3. Another Collar 4 is bolted to the other tapped bore at each of the first two Collars, and Grub Screws, one in each of these, form the axle for a 1" Loose Pulley fitted with a Rubber Ring.

A third Coupling is then fitted to the front ends of the Crank Handles.

The body of the barrow is formed from a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate, the edges of which are turned up at each side. This is bolted to the rear Coupling and to it is bolted a second $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate, which is bent upward at its front end. Two 1 " \times $\frac{1}{2}$ " Angle Brackets are bolted to

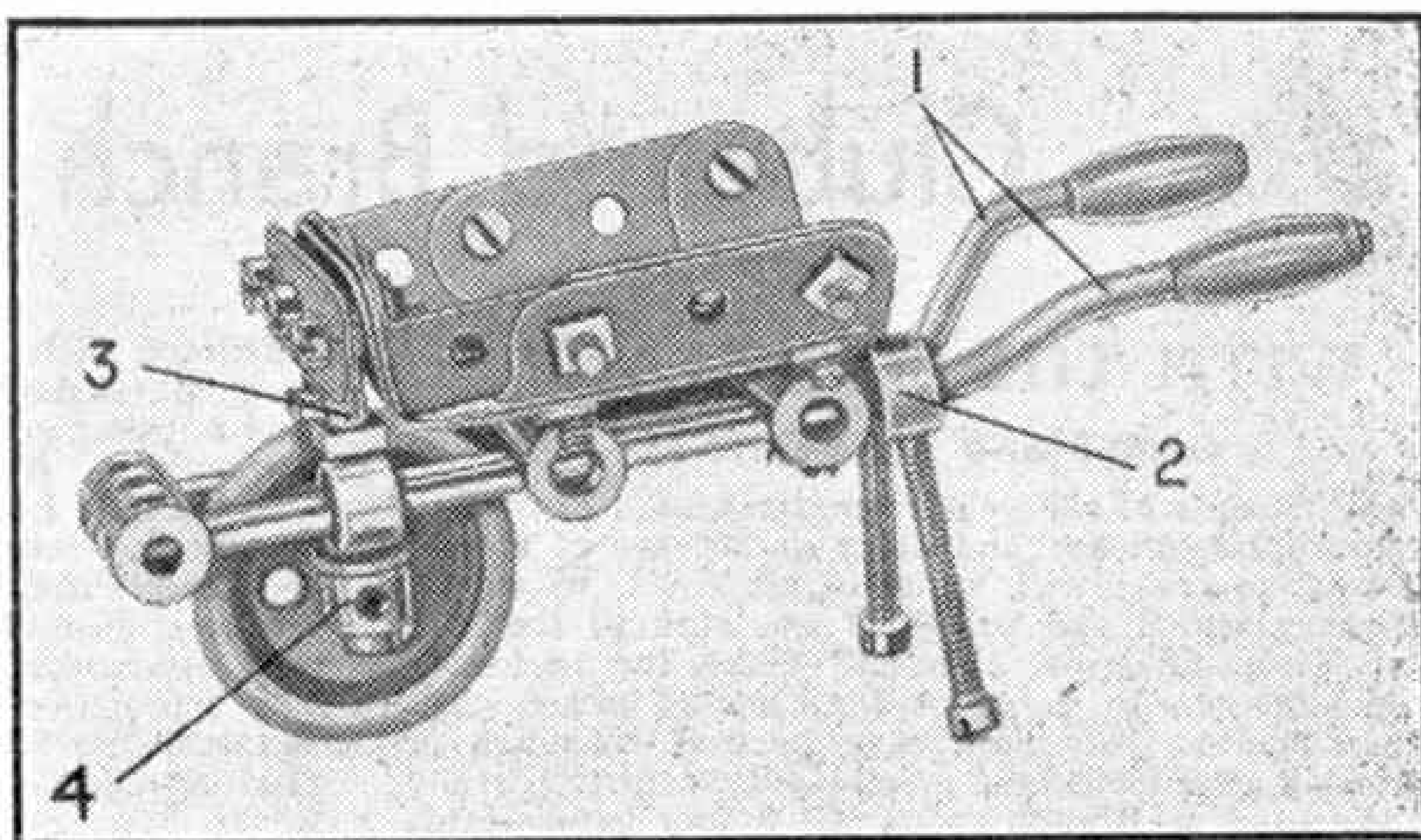


Fig. 2. A simple Meccano wheelbarrow that requires only a few parts.

the Flexible Plates, which are strengthened by fixing to them a $2\frac{1}{2}$ " and a $1\frac{1}{2}$ " Strip. The front of the body is attached by means of another $1\frac{1}{2}$ " Strip to the Threaded Pins 3.

Parts required to build model Wheelbarrow: 1 of No. 5; 4 of No. 6a; 3 of No. 12b; 2 of No. 19g; 1 of No. 22a; 12 of No. 37a; 8 of No. 37b; 2 of No. 38; 6 of No. 59; 3 of No. 63; 1 of No. 111a; 5 of No. 111c; 2 of No. 111d; 2 of No. 115; 1 of No. 115a; 2 of No. 188.

Another "Simplicity" Contest Prizes for Easily-Built Meccano Models

By "Spanner"

At this time of the year, especially if the weather is sunny, model-builders wish to spend as much time as possible in the open air. With this in mind we announce another of our "Simplicity" contests, which will be open until the end of July.

Competitions of this kind are always attractive in themselves, and there are other good reasons that will make this contest welcome and will encourage a large entry. One is that owners of small Outfits and model-builders who have been prevented by wartime regulations from adding to their stocks of Meccano Parts can figure as prominently as those with larger resources. A second is that "Simplicity" models usually can be represented by simple drawings, a great advantage now that films are difficult to obtain.

The first step in the preparation of an entry is to choose a subject that can be represented realistically by a small number of parts and to build a model of it on these lines. It is a good plan to scrutinise the result very carefully in order to see if certain parts can be missed out, or replaced by others, fewer in number perhaps,

that will give an even better effect. The prizes will go to those whose models show the best uses for the least number of parts, so that there will be plenty of scope for model-builders to exercise their ingenuity in simplifying. More than one model may be entered by any competitor, but no competitor can win more than one prize in the contest.

When the model is ready the competitor should have it photographed, or make drawings showing its general appearance and construction, and these should be forwarded, together with any notes that may be necessary, to "1944 Simplicity Model-Building Contest, Meccano Limited, Binns Road, Liverpool 13." The competitor's age, name and full address must be written on each section of his entry.

Entries will be divided into two sections, A for competitors of 15 years of age and over, and B for those under 15. In each prizes of £2/2/-, £1/1/- and 10/6 respectively, will be awarded to the best entries in order of merit, and there will be consolation prizes of 5/- each for other good efforts. The contest closes on 31st July.



Club and Branch News



WITH THE SECRETARY

GAMES AND AMUSEMENTS

At this time of the year recreations such as cycling and rambles, cricket and other games are of special interest, together with visits of all kinds, to works, railway stations and so on. I am glad to see that most Clubs recognise this and make the necessary arrangements. In doing so they should not neglect indoor games, for there may be wet evenings or Saturday afternoons, and members then turn naturally to the Club or Branch room. Of indoor games table tennis is still one of the most popular, and rightly so, for it requires little space and yet involves real activity. It is too a game that can be played with little preparation, provided that the equipment is kept in good order. This is an important point as far as all material is concerned. Meccano Parts and Hornby locomotives, coaches and accessories are invariably kept in good condition, and similar attention should be given to other Club and Branch possessions, especially those that are not in constant use.

TAKE CARE OF MATERIAL

A good plan, which can be brought into operation with advantage now, is to appoint say two members to take charge of games and recreation material, to see that it is listed, properly stored and if necessary renovated, so that it is ready for use at a moment's notice. This is as necessary as it is to have Club Meccano Parts or books in the library catalogued and arranged so that anything required can be found easily. Stewards in fact should be in charge of every branch of equipment. This makes a Club efficient in working and its meetings enjoyable, with none of the exasperating moments when something urgently needed cannot be found, or is in need of attention.

PROPOSED CLUBS

LONDON—Mr. S. J. Salisbury, 9, Cubitt House, Poynders Road, Clapham, London S.W.4.

LONDON—Mr. R. L. Barnett, 61, Amity Grove, West Wimbledon, London S.W.20.

PROPOSED BRANCHES

KEMPSTON—Mr. H. Gilbert, 62, King Street, Kempston.

LIVERPOOL—Mr. M. Wright, 7, Worcester Avenue, Waterloo, Liverpool 22.

WORCESTER—Mr. D. F. Pitts, 116, Wyld's Lane, Worcester.

CLUB NOTES

STRATFORD-ON-AVON M.C.—At this newly-affiliated Club's first meeting Mr. A. L. Cull, Leader, gave a talk on Club management and officials were elected. Model-building Evenings alternate with Games. A Film Show has been given by one of the members. Club roll: 10. *Secretary*: D. P. Cull, "The Bijou," Wood Street, Stratford-on-Avon.

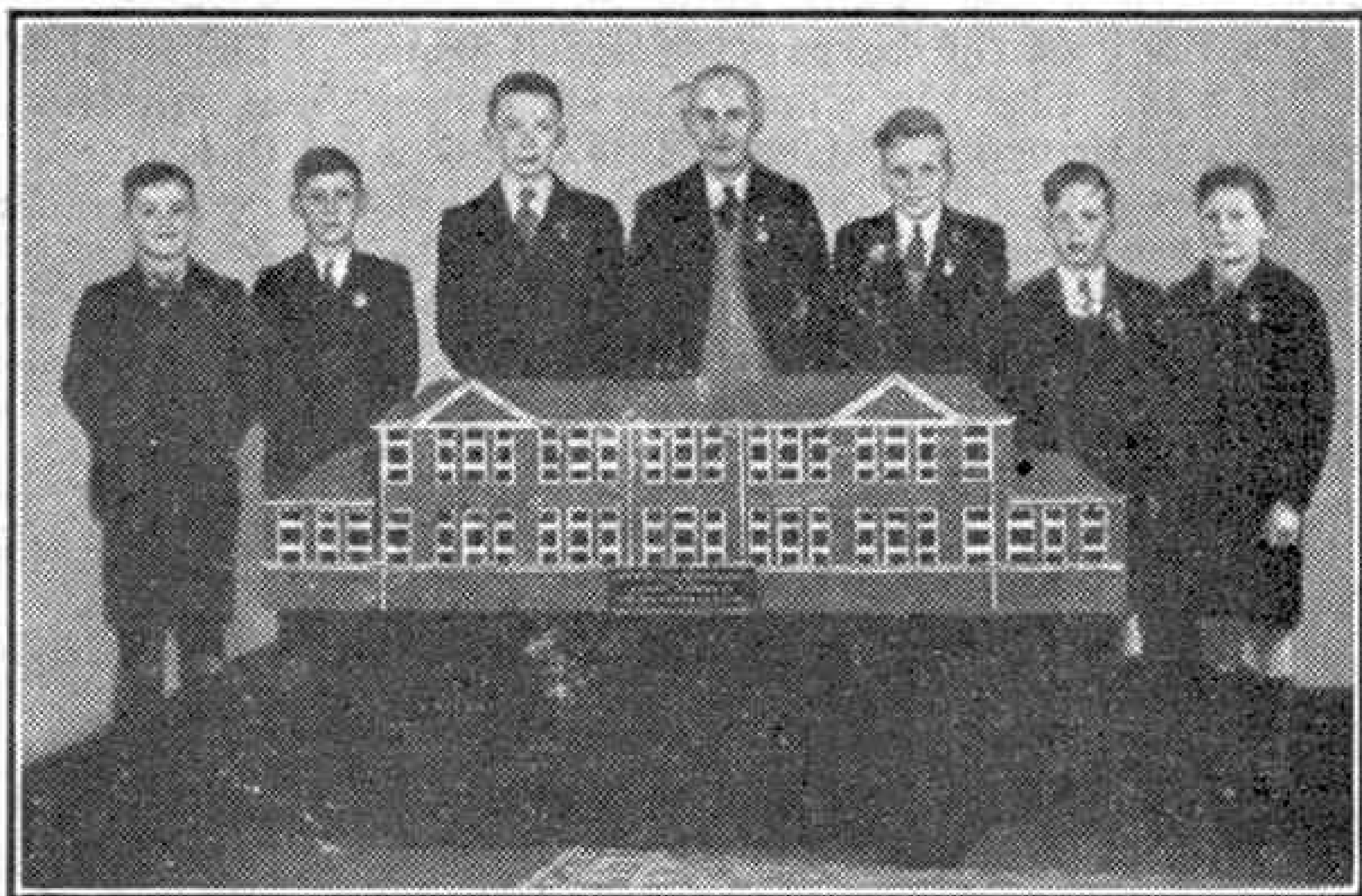
HORNSEA M.C.—Successful Senior and Junior competitions have been concluded, the winners being P. Giles and B. and C. Postill. Model-building on a satisfactory scale was continued. The seniors have

continued their telephone meetings and film subjects have included the manufacture of coal gas and telephone construction and operation. Club roll: 34. *Secretary*: C. Kemp, 5, Carlton Terrace, Hornsea.

CROSLAND LODGE (HUDDERSFIELD) M.C.—An outstanding recent event was a series of contests in aid of the Huddersfield "Salute the Soldier" effort. Cricket Matches, Rambles and other outdoor activities have now been taken up, and it is hoped to publish the Club's projected Magazine. Club roll: 17. *Secretary*: D. Graham, 22, Moorside Avenue, Crosland Moor, Huddersfield.

AUSTRALIA

MELBOURNE (AUSTRALIA) M.C.—Great fun followed the construction of the Meccano walking kangaroo



The new committee of the Exeter M.C., with Mr. M. C. Hodder, Leader. D. Parker, President, is on the leader's left, and S. Coles, Vice-President, is second from left. The model is a reproduction in Meccano of the Lady-smith School, and the rooms in this have now been completely equipped with miniature furniture, including even tiny pictures on the walls.

and rope climbing monkey, and a Meccano electric questioner for identifying stamps also has been built. Preparations have been made for the Club's part in a forthcoming Models Exhibition. Interesting train operations have been carried out, and there was special interest in a demonstration of mystery control, in which a train obeyed spoken orders by the Leader. Club roll: 12. *Secretary*: L. Isop, 8, Hayes Street, Northcote, N. 16, Victoria, Australia.

BRANCH NEWS

WOODLANDS (HALL)—Electric lighting has been fitted in all stations, sheds, etc., and members have learned to work well together in shunting. Discussions have been held on railway subjects. A collection of railway photographs and illustrations is being made. *Secretary*: D. Kennington, 53, Scalby Grove, Calvert Road, Hull.

DUKINFIELD—The Branch has now been incorporated and train operations at meetings progress smoothly. Decorations have brightened up the track room considerably. The layout includes a large marshalling yard with a "hump." Cycle Runs, Lectures and a station visit have been very much enjoyed. *Secretary*: L. D. Broadbent, 395, Cheetham Hill Road, Dukinfield.

More Fun With Your Hornby Railway

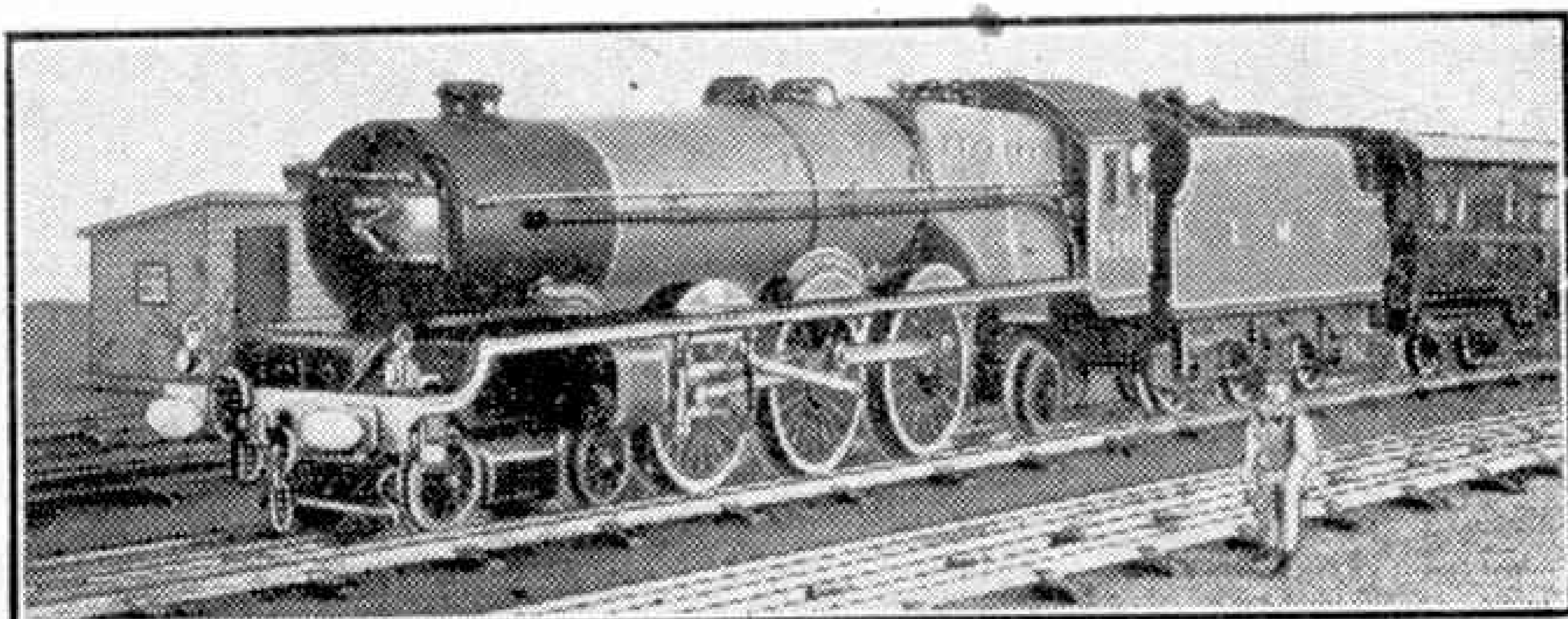
Round about a Passenger Station

IN arranging the running programme of a miniature railway system a good deal of attention is quite rightly given to what we may call the "best" traffic, that is the operation of express trains. Our model "flyers" may be distinguished by real or imaginary names, and the complete formation probably looks very fine as it speeds along the track with a powerful Hornby Locomotive at its head. Various details, however, may be overlooked, even by the keen operator, which make all the difference in the "atmosphere" that should attend the running of our crack expresses. Some of these of course may apply to other trains as well. However, we will deal with express traffic first.

On commencing operations it is much more realistic to assemble the various vehicles that are to compose our express by using an engine to act as "carriage shunter." The mere putting together of a train by hand is really no quicker, and will immediately be commented on by a critical observer who is perhaps being shown the railway for the first time. Once the train is complete and connected throughout by means of the usual corridor connections, we must not forget the name or destination boards, and the end plates that take the place of the corridor connections at the head and tail. A red tail lamp should be placed on the bracket of the last vehicle before the made-up train leaves the carriage siding for the station.

The exact arrangements now depend on the actual track layout, but if the empty coaches have to be moved any distance along the running lines to the starting point, the shunting engine should lead them. It will display of course the appropriate headlamp indication, that is one lamp in front of the chimney and another over the right-hand buffer. This is an item that sometimes gets missed! If the train is to start from a terminal the engine will run right in

up to the buffer stops and may have to stop there until the train moves off. It may be, however, that we shall need this engine for another operation in the meantime. If the platform line has a run-round loop it is simple enough to release our shunting engine once it has brought the train in.



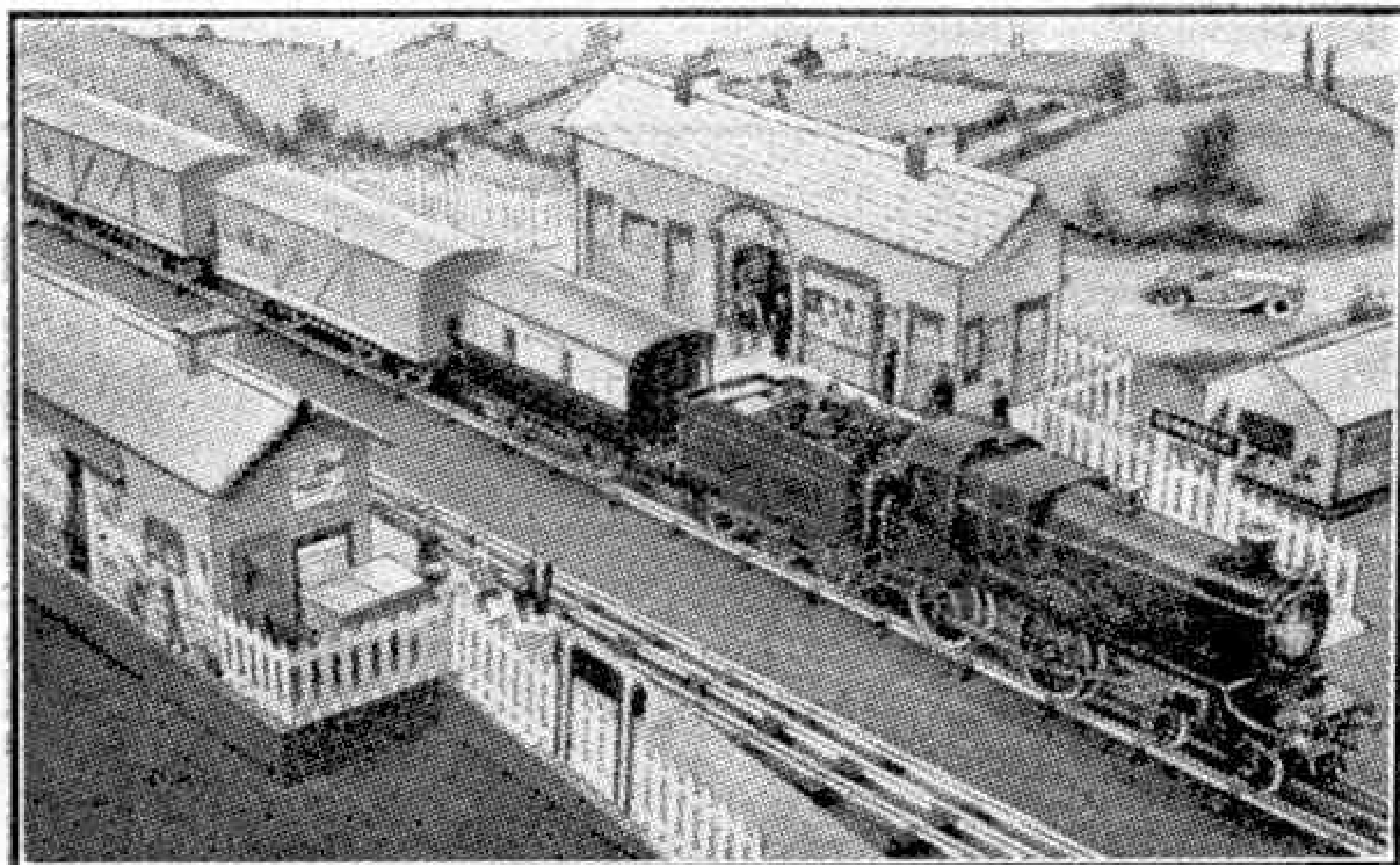
L.M.S. "Princess Elizabeth," the biggest Hornby Locomotive, working an express passenger train.

Frequently, as the result of limited space, there is no room for such a loop, the terminus being just a simple branch more or less off the main continuous track. In that case we can stop the train clear of the points leading to the terminus, make use of the continuous track to get the engine to the other end, and thus enable it to push the train alongside the departure platform. All that remains now is to uncouple the engine and move it off, change the train tail lamp from one end to the other, and await the arrival of the main line engine.

Similar operations, though not in the same order, will be gone through at the end of the run, the exact details depending on the layout. There is a tendency among miniature railway operators to leave too fine a margin between the arrival of a train and the departure of the same set of coaches on another service. It should be remembered that real long-distance trains often "rest" for quite a time at terminal platforms. Then they move out to the carriage sidings for cleaning and servicing in some respects before another run.

In miniature therefore a set of vehicles should be allowed to wait at least a little while in the sidings before the next long-distance journey. The time thus spent is not really wasted as it might appear to be at first sight. The engine that has arrived has to be disposed of, turned round and made ready for its next trip. Where only one operator is available this is necessarily a separate operation from the handling of the train.

Other traffic dealt with at passenger stations includes parcels, newspaper and similar trains. These add an element of novelty on a Hornby layout and can be made up of miscellaneous vehicles of the van type. The ideal vehicle is the No. 2 Luggage Van which reproduces the "general utility" type of bogie van found in actual practice. It can be supplemented with the No. 1 Luggage Van and the train can be ended with the No. 1 Guard's Van.



A parcels train on a Hornby layout hauled by G.W.R. "County of Bedford" Locomotive.

Dublo Streamliners and their Work

A FEATURE of modern locomotive practice is the intensive use that is made of practically all engines and the varied work that many of them have to perform from the beginning of a turn of duty until they come back to their home shed. This is most useful to the miniature railway owner who, under present conditions, is lucky if he has a Dublo Tank Locomotive for general use and a Streamlined

use it to work a stopping train, perhaps one that will form a handy return trip in between the main line runs. Quite frequently big engines fill in their "odd moments" in this way, and certain stopping trains are regularly used for exercising engines that have been under repair and require "running in." This is a very useful practice from the miniature operator's point of view, for it enables him to run

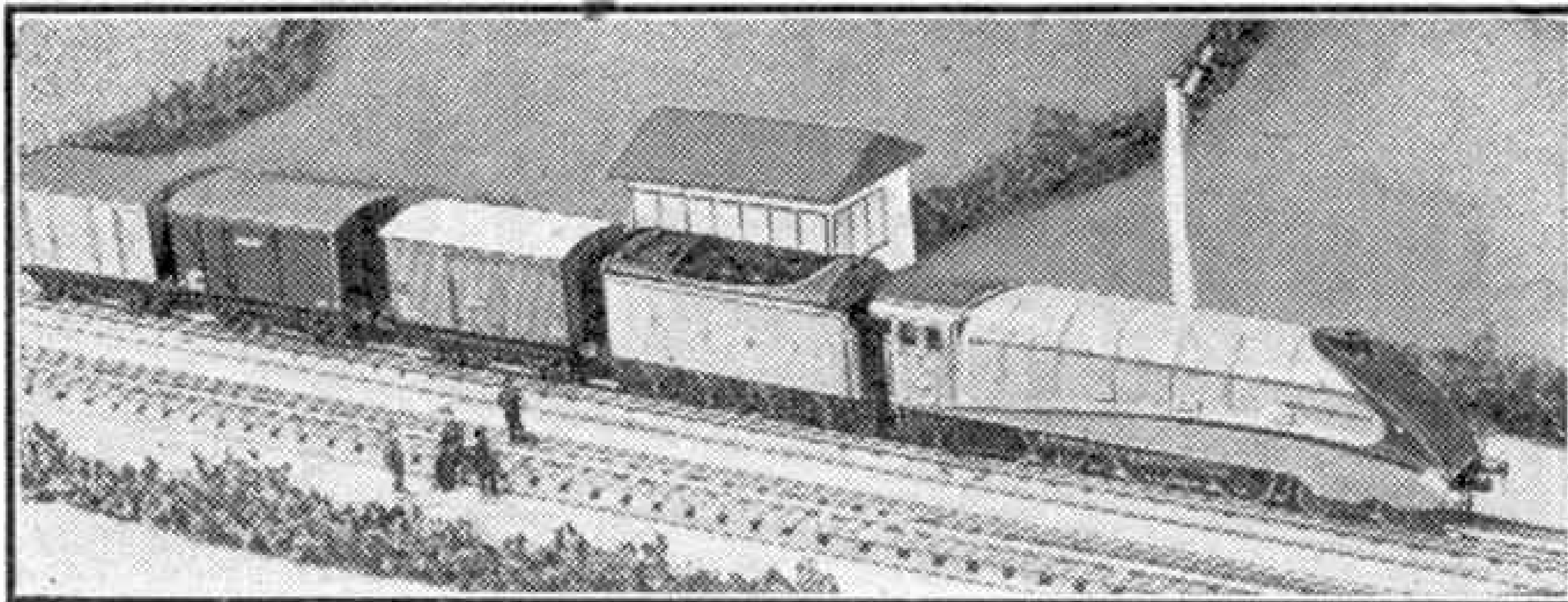
quite secondary services with a streamline "Pacific" without any fear that this is incorrect. Even if the scheme is not followed regularly, the occasional appearance of a main line engine on a slow train will add to the interest of the running programme.

A practice that has become increasingly common in recent years is the use of express engines on fast freight trains. Often such trains are timed quite fast between stops and as their loads are not unduly great a passenger engine is quite a suitable type to use. Fast freight trains,

either perishable or general in their traffic, or nowadays perhaps just "W.D.," are certainly important, and the appearance of a 4-6-2 express engine at the head of such a train is really no affront to its dignity!

Some really good freight flyers can be made up with Dublo Vans; such a train is shown in one of the accompanying illustrations, where the "Pacific" at its head gives an urgent air to the proceedings. Generally this kind of traffic is taken over long distances without "breaking bulk," that is without any breaking up of the formation at intermediate points. This, however, can be varied according to the conditions on our layout. On a long run, too, it is usual to make one or two stops, perhaps for train examination; and as a rule the engine is "watered" at the same time. This is just the chance to use either of the water tank accessories that we made from Plasticine from the details given in these pages in September last year.

Finally, under the stress of wartime conditions it is permissible to use the same engine even on an ordinary through goods or coal train. There is therefore plenty of scope for interesting locomotive work with a Dublo streamliner.



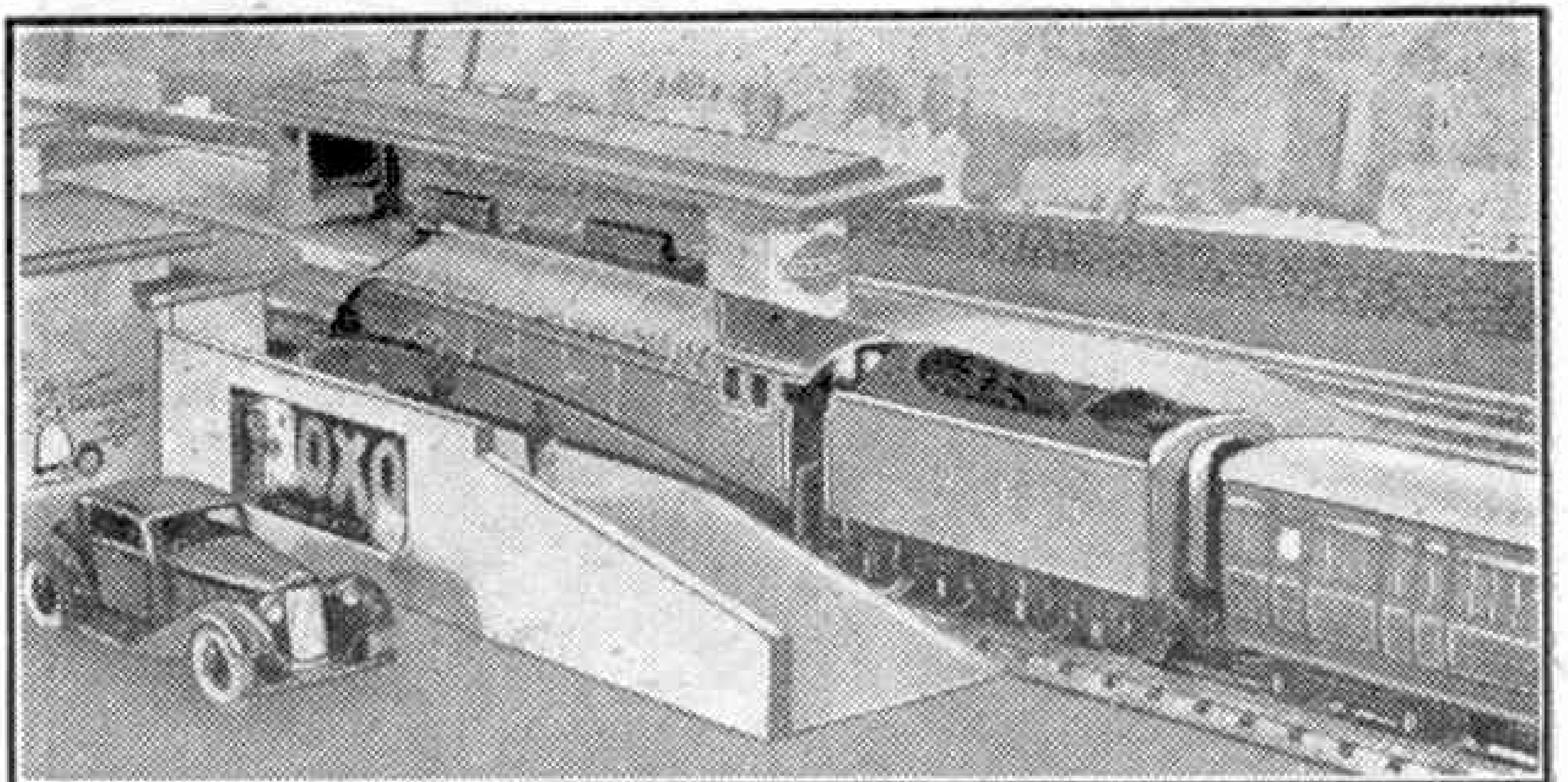
A Dublo fast freight train hauled by 4-6-2 "Sir Nigel Gresley." The "platelayers" in the near track are apparently taking a "spell."

Express Locomotive as well. The usefulness of the Tank Locomotive has often been referred to in these pages; let us see how this "general service" idea works out in the case of the miniature "A4."

The type of work for which our No. 4498 "Sir Nigel Gresley" is most suited is of course the running of express trains. It has a splendid turn of speed for working fast trains of moderate weight, and many a working programme on a Dublo layout includes such typical "pre-war flyers." For the heavier but slower trains of to-day, the little "Pacific" has plenty of power, and can usually deal with any train that the platforms on its owner's layout can accommodate. The condition of track, stock and locomotive are of course important but, as we have dealt fairly fully with these details in recent issues, there is no need to say more at this point. Care and attention naturally bring their own reward in satisfactory running.

The first duty we give to our streamliner, then, is probably the haulage of an express passenger train. This can be run on the "mileage" system which we have previously described, but probably we shall prefer to work on the basis of "so many circuits represent the run from King's Cross to Peterborough," and so on. Perhaps we make a series of runs from point to point so that the final stretch brings us to "Newcastle" or maybe "Edinburgh." It all depends on the geography of our system. This may be completely imaginary of course, with our own made-up names for the various places served. This is a favourite scheme with many readers and there is a great deal to be said for it. It allows free use of the imagination in building up as it were the "topography" of the line, which should really govern the services afforded and the types of vehicles in use.

By now no doubt it is time for our engine to have a visit to the locomotive shed, or at least to the engine yard or siding for "coal and water." When this has been attended to, we can



A typical Dublo Station scene showing a main line train running alongside the platform.

Isolating Rails in Hornby Dublo-Layouts

THE Hornby Dublo layout shown in the diagram on this page requires a space of 6 ft. by 4 ft. to accommodate it comfortably. It is intended primarily for electric operation and includes several of the standard Isolating Rails; these are shown in solid black in the diagram and are indicated by the letter "X." The same system can be laid out for clock-work operation; the only difference being that the Isolating Rails are replaced by a similar number of standard Straight Quarter Rails. Alternatively, where there are two Isolating Rails included in the same straight length of track, as occurs on the inner main line in the diagram, then a standard Straight Half Rail can be used instead.

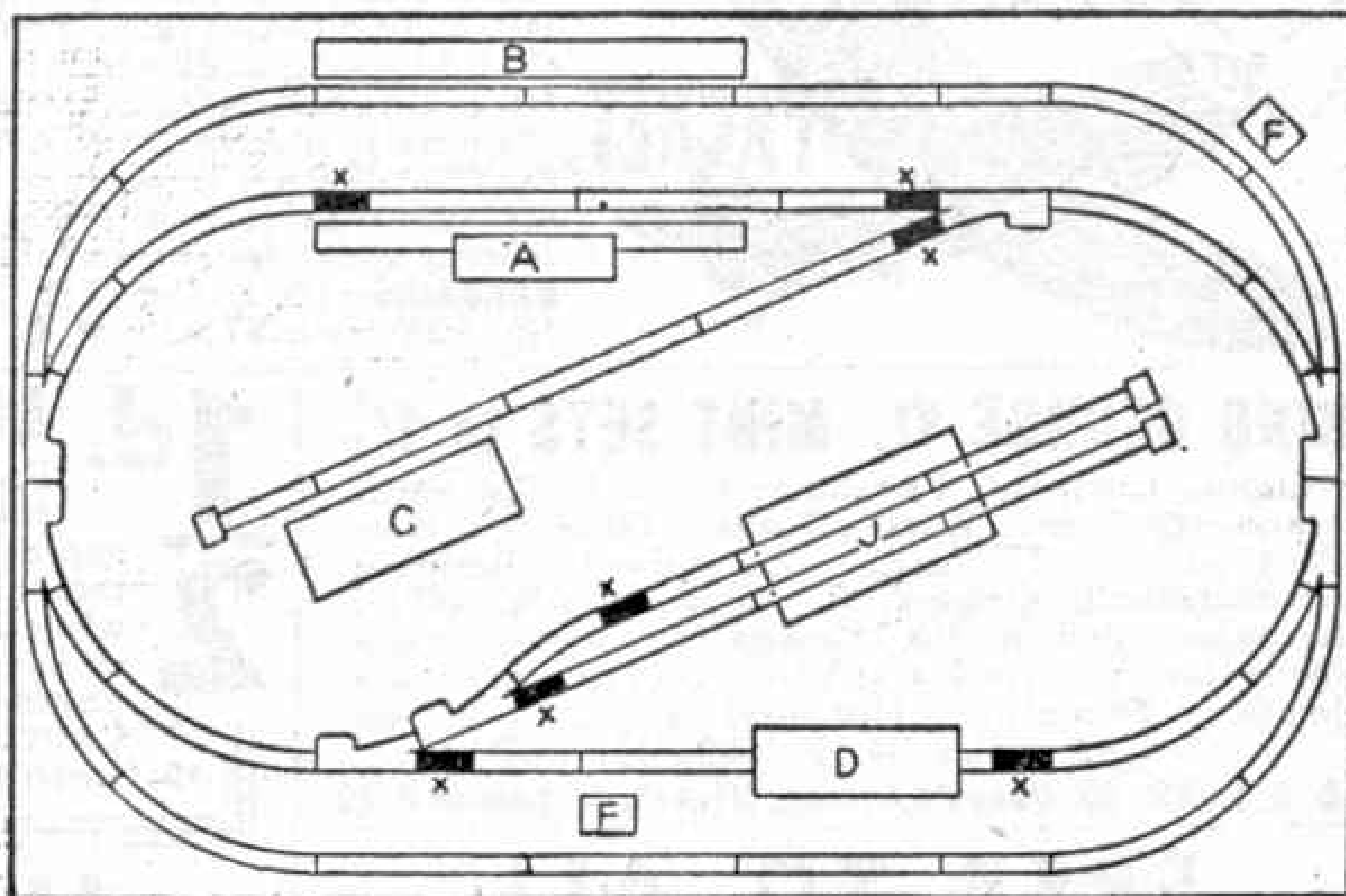
A point to be noted on electrically-operated systems on which the Isolating Rails are included is that where these are found in pairs on the same length of track, only one rail of each pair need be connected to a Switch (D2). Where they appear singly, as in the Engine Shed tracks and on the goods siding in the middle of the layout, each Isolating Rail requires a corresponding Switch.

The layout consists of two main ovals, the ends of which are made common to one another by the use of points. The outer oval has no special features, apart from these points; the inner one, however, has two sets of tracks branching off from it. The upper one in the diagram is the goods siding previously mentioned, serving the Dublo Goods Depot indicated by "C." The lower branch immediately divides into two parallel tracks which run through the Engine Shed building "J".

The Main Line Station and the tracks just near it are well arranged for the addition to a passenger train that is standing at the station, of an odd goods van, or its subsequent removal. Let us see how this is worked out.

We will suppose that we have a Two-Coach Articulated Unit standing at the station; to begin operations an engine leaves one of the shed tracks while another remains on an isolated section of the other track. The first engine proceeds in a clockwise direction, picks up the coaches just referred to, and then begins a journey in an anti-clockwise direction. It can call at either of the stations in turn, and similarly it has a choice of routes over the lower half of the layout.

At last it reaches the stop at the Main Line Station where there are two vans to be attached. We must be careful to stop the train so that the engine is within the section between the two Isolating Rails. This section is then made "dead" by operating the appropriate Switch D2, which can be connected to either of these rails as convenient. Now we switch in the "dead" shed track and move the second engine



Key to the layout described on this page. A: Main Line Station; B: Island Platform; C: Goods Platform; D: Tunnel; F: Signal Cabin; J: Engine Shed; X: Isolating Rails.

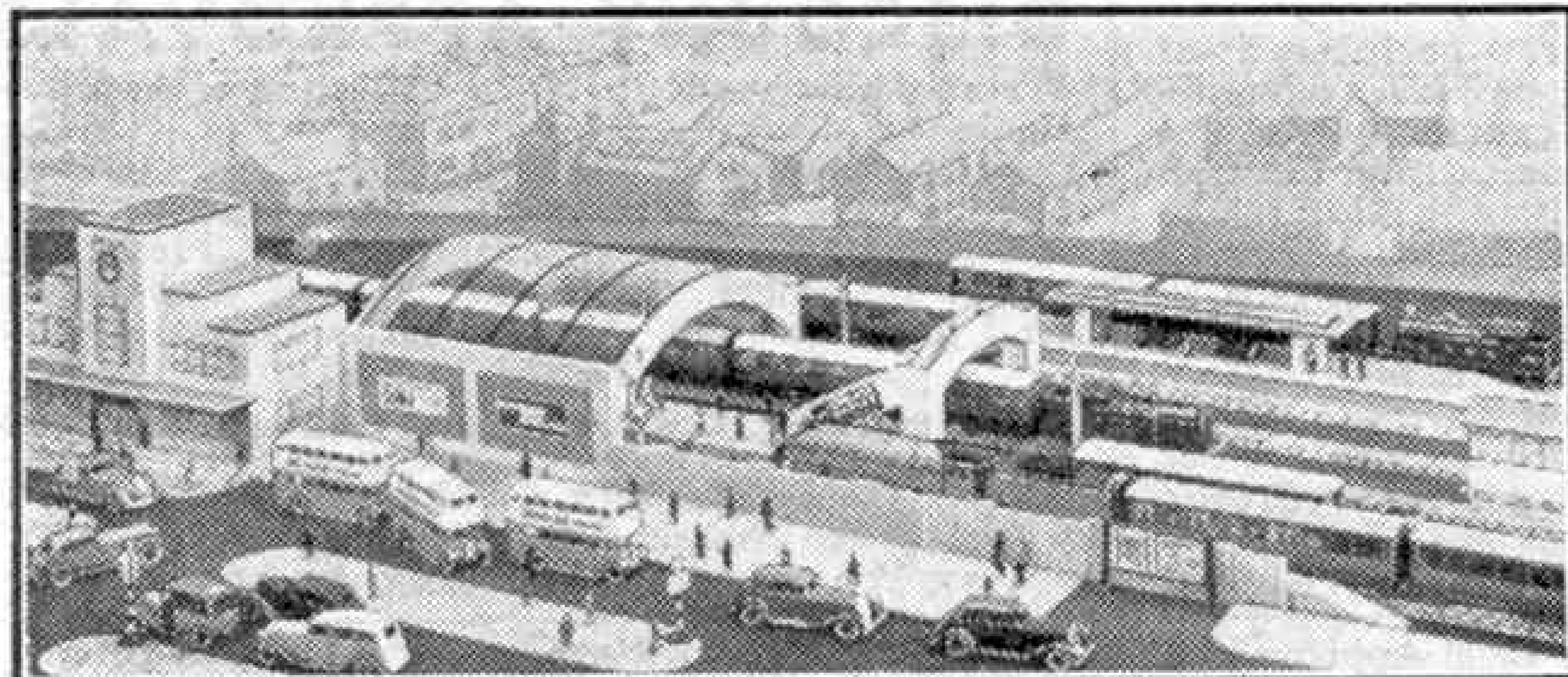
on to the main line. It can make its way to the points leading to the Goods Depot where the vans are waiting, and couple up to them. The vans are drawn out on to the running line and then gently pushed up to the tail of the waiting train.

A point to note here is that the train has to be halted so that the shunting engine does not come into contact with the Isolating Rail on the running line. If its collector shoes happened to bridge the isolating gap, the "dead" section would be made "live," and the train engine would try to move. A little trying out beforehand will show just where to stop the passenger train.

Having uncoupled the shunting engine, we can run it back to the shed again or move it into the goods siding. Whichever section it goes to can then be made dead, the station section can be switched in again, and the passenger train then resumes its journey. Similar operations are necessary when the vans are to be detached. They can be replaced in the goods siding, or can be worked round to one of the shed tracks.

Finally the passenger coaches can be left at the station again, or at the Island Platform, and the first engine can be returned to the shed. The second engine can now perhaps make a trip with a train of goods stock from the siding, make various stops, detach and pick up various vehicles as required, and so on.

Similar evolutions can be carried out by means of the other isolating sections on the line.



Splendid operating possibilities are afforded on a Hornby Dublo Station layout like this by means of the isolating schemes described in this article.

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Stamp Collecting

Aden's Short Stamp History

By F. Riley, B.Sc.

IN the "M.M." for November and December last I told briefly the story of the stamps of Gibraltar, Malta and Cyprus, three strongholds of the British Empire in the Mediterranean. Passing southward from Cyprus through the Suez Canal and the Red Sea, we come to Aden, another famous Empire post,



harbour was used by the Romans, and its celebrated water tanks, hewn out of the rock, are centuries old. Under British rule it has regained its ancient importance as a gateway to the States of Southern Arabia.

Aden was visited by the Portuguese when they pioneered the sea routes to the East, but they never made any use of it, and the rock became British in 1839. Six years earlier Commander S. B. Haines had been sent to survey the coast of Arabia with the idea of founding a coaling station there. The first idea was that this should be at Mukalla, to the East of Aden. In 1837 a British ship was wrecked at Aden and her cargo was looted, however, with the result that Commander Haines was again sent out to compel restitution. Then he realised that Aden's splendid harbour was ideal for the projected coaling station. He persuaded the ruling Sultan to cede the town to Great Britain in February, 1838, but when he returned in October to take possession the Sultan had changed his mind and it was necessary to send a stronger force in the following year. After a fierce bombardment troops were landed to storm the Sultan's palace and to capture the gates. Two columns met at the Aidrus Mosque, outside Aden itself, which was full of non-combatant refugees, and these were protected by a picket while the troops completed the occupation of the town and harbour.

Aden was captured by troops sent from India and for almost a century it was part of British India. So when the time came for the introduction of stamps, it was those of India that were used, and Aden's own stamp story did not begin until 1937, when the

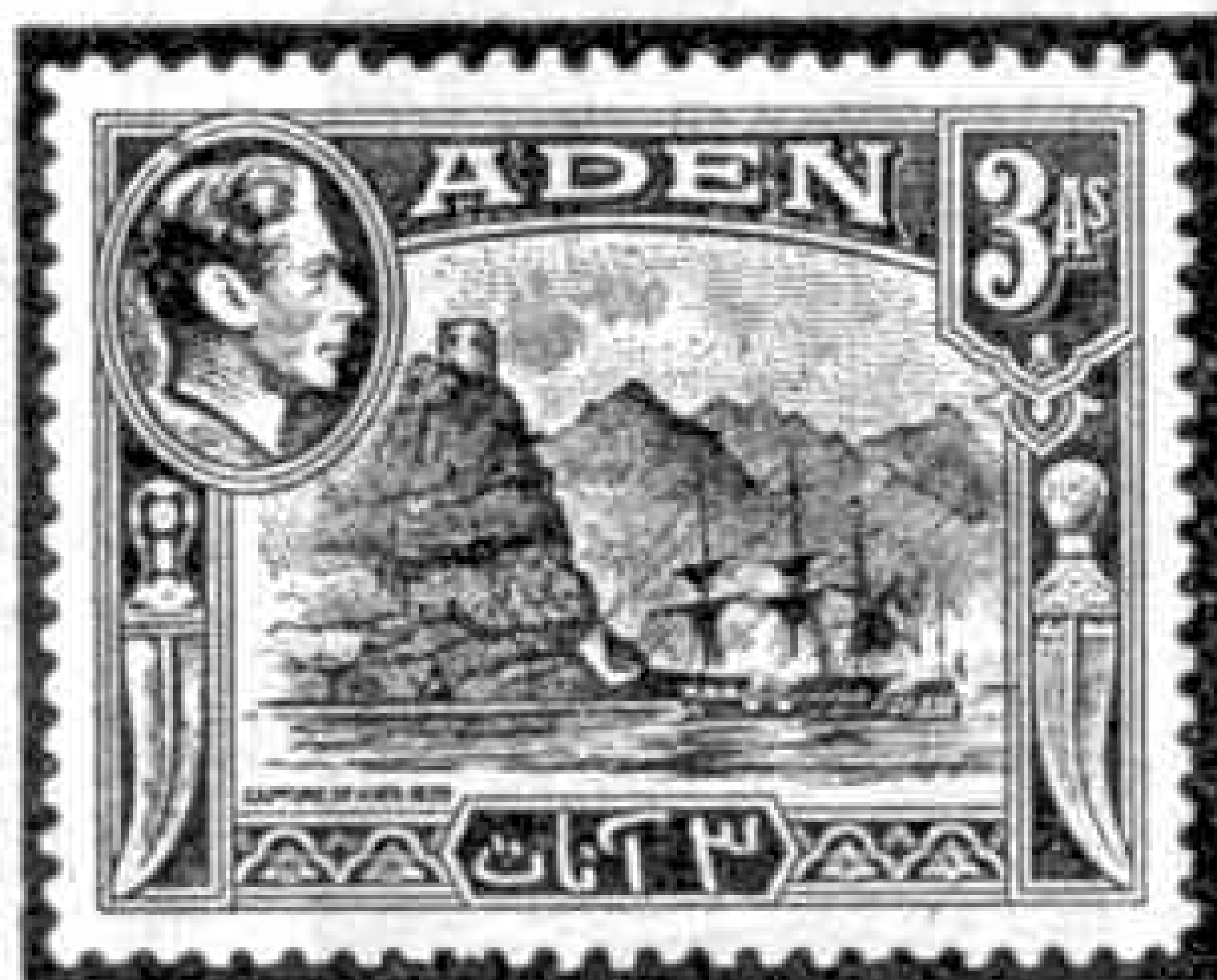


port was made into a Crown Colony. Stamps were in Indian currency, the values beginning at $\frac{1}{2}$ anna and mounting up to 10 rupees, 12 values in all, with different colours as the only distinctions between them.

The customary portrait of the King was omitted owing to lack of time, and so the stamps, as far as the pictorial part of them is concerned, are purely Adenese, for they show examples of one of the most characteristic of the colony's products, the famous Adenese dhow.

These stamps remained on sale until 12th May, for it was Coronation year, and on that date three stamps to celebrate the great event were issued. They were of the well-known design showing portraits of the King and Queen, and remained the stamps of Aden until the end of the year, when the sale of the original stamps was resumed. This set was finally withdrawn on 19th January, 1939.

The reason for the disappearance of the first stamps of Aden was the issue of a set of centenary stamps. It was 19th January, 1839, when the seaward defences of Aden were bombarded and the troops landed to take possession of the port, and one of the stamps, the 3a. value illustrated on this page, professes to show the capture. It certainly shows a scene during the attack, with a British vessel engaged in bombarding the rock, seen beyond it.



The centenary set is a handsome pictorial one, with 12 values from $\frac{1}{2}$ a. to 10 r. in 6 different designs, four of which are illustrated on this page. The lowest value, $\frac{1}{2}$ a. green, shows the Aidrus Mosque, which figured prominently in the events leading to the acquisition of the port, and the same design appears on the

sepia 2 a. value. Camels naturally find a place in the stamps of an Arabian country, and so we find these desert creatures on the $\frac{1}{2}$ a. brown and 5 r. green and brown values, which actually show a trooper of the Adenese Camel Corps. The typical Arab dhow also made its appearance in this set, on the $1\frac{1}{2}$ a. scarlet and 1 r. green values. This stamp is easily distinguished from the first Adenese issue by the inclusion of the customary portrait of the King.

Of the two other designs in the series, one of them, on the 1 a. pale blue and 2 r. deep blue and magenta values, shows Aden Harbour, a general view from the sea. The other, on the $2\frac{1}{2}$ a. ultramarine and 8 a. red-orange value, gives a picture of Mukalla, the chief port of the Western Protectorate. Presumably this is included in the set because of the survey we have mentioned.

The stamps of Aden share in the increased interest of British Colonials that has followed on the wartime issues of new printings, often with new shades and new perforations, and on different paper and with whiter gum. There were new printings in July 1942 and January 1943, and a 14a. value, with the 3a. design illustrated on this page, is announced as on order.



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For other Stamp Advertisements see pages 210 and viii.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe



LAST month we mentioned the new "overprints" for

the Falkland Island Dependencies. We are now able to illustrate them. Of course nothing so exciting for colonial collectors has appeared since the Bahamas "Landfall" issue of 1942, and such has been the rush to purchase, by those very collectors who are supposed to frown on special issues, that quite a few of them may have to go without until further supplies are available.

When will the authorities realise that those who take it upon themselves to speak on behalf of the hobby represent nobody but themselves, or at most an insignificant minority, and not even a disinterested one at that, when they claim that collectors do not welcome new issues of stamps, such as the "Landfall" and the "Dependencies" sets?

It is said that the Colonial Office will only authorise stamp changes once every decade. This is done presumably, in deference to collectors' wishes, but it is an entirely mistaken policy. Before the war the modern stamps of countries like Germany, France, Belgium, etc., were gaining in popularity all the time. Why? Simply because these countries were bringing out new sets of attractive stamps all the time. This kept the interest of collectors alive, but it seemed a great pity that so much cash went to these various countries, which could quite easily have been kept at home, had our own authorities remembered that Queen Anne was dead.

Incidentally nobody should think that the new "overprints" for South Shetlands, South Georgia, South Orkneys and Graham Land have been prepared for their delectation, for the object is a great deal more important than that. As a matter of fact, postage stamps are being used as a counter in international politics, and the issue of these stamps is just one move, no doubt of several, to underline our claim to lands covered by the emission.

It is now about 35 years, July 1908 to be exact, since letters patent were sent to our governor at Stanley, capital of the Falklands, authorising him to make the necessary annexation. It was rather surprising that we had not taken the step previously; even so there was a certain amount of grumbling by other interested powers, but Norway was the first one to make a real move and 19 years afterwards, on 1st December 1927, she annexed Thompson and Bouvet Islands, about 1,350 miles south-west of Cape Town,

and after diplomatic exchanges we agreed to the latter annexation.

Six years after this, during a visit by Admiral Evans to Bouvet Island, five values of current Norwegian stamps were overprinted "Bouvet Oye," that is Bouvet Island, and while these stamps have never been listed by Gibbons, they do mention them in a footnote. They are interesting little stamps and next month we will illustrate one.

Another interesting stamp to be issued in these

parts was a local for Tierra del Fuego, and some other time we will perhaps have something to say about it.

Yet one more interesting event for colonial collectors is the appearance of a new



edition of Gibbons' Catalogue Part I, British Empire, and here again not all will have been able to obtain a copy, for as the only catalogue published in Great Britain with any appreciable effect on postage stamp prices, collectors were awog to see "what's gone

up." Well, for the benefit of those who missed their copies, it can be said that there are plenty of price changes, mostly upwards, and also plenty of bargains, at full catalogue, if one can be lucky enough to find them. The Editor in the preface touches on the question of prices, and collectors who still expect to buy all stamps at a good percentage off catalogue quotations are likely to show lots of blanks.

A number of stamps of enemy origin have recently appeared on the market, some, it is said, having been sold by mistake at a London stamp auction. Readers are warned that it is illegal to own such stamps, let alone buy them, that is of course stamps emitted by the

Axis countries since the outbreak of the present war. So care should be taken to shun such issues. Strange to say, this also applies to the A.M.G.O.T. stamps in use in Southern Italy. It is hard to fathom the logic which has caused these stamps to be taboo. If the Board of Trade has anything to do with it it is understandable.



As many collectors already know, the 3 c. and 96 c. stamps of British Guiana have lately appeared in a new perforation, $12\frac{1}{2} \times 13\frac{1}{2}$, and this change now brings the former stamp into the purview of a George VI collection; the stamp in its original perforation first appeared as long ago as 1934. All spaces for Waterlow stamps of similar format should be filled as soon as possible. Readers should complete the current set of Jamaica, as there is talk of a new commemorative set.

Streamlined Trains at Home and Overseas—

(Continued from page 189)

Back in Britain the striking success of "*The Silver Jubilee*" prompted further development of the limited-accommodation high-speed express. So in the summer of 1937 there commenced to run those two notable streamliners, the "*Coronation*" of the L.N.E.R. and "*The Coronation Scot*" of the L.M.S. The L.N.E.R. service linked the English and Scottish capitals in a 6-hour run, the overall average speed being 65.5 m.p.h. The L.N.E.R. train carried at its rear end a special "beaver-tail" observation coach, but in other respects followed the general style of the pioneer "*Silver Jubilee*." It was strikingly finished in two most attractive shades of blue with stainless steel lettering and other trimmings. To match the train was put into service a set of blue-painted "A4 Pacifics" named after British Dominions and carrying their armorial bearings.

Streamlined locomotives were a new venture for the L.M.S., and the general technical design of the engines was a development of the "Princess" class 4-6-2s. The capabilities of the new design, with its remarkably curved front end and "bow wave" effect of its silver white lines, were shown in a striking manner by No. 6220, "*Coronation*," the first one built. On a special run with the train before going into regular service, 114 m.p.h. was reached under the management of Driver Tom Clarke, a locomotive wizard now retired. The coaches of the L.M.S. train were not streamlined, though they incorporated many improvements on the standard stock.

A little later the L.N.E.R. inaugurated another streamline service, this time between Bradford, Leeds and London. This was the "*West Riding Limited*," an eight coach flyer similar in outline and finish to the "*Coronation*" but without the "beaver-tail" end vehicle.

The final development before war conditions put a stop to further progress was the building of new stock by the L.M.S. for their "*Coronation Scot*" service. The first of the new trains, which had not seen service on its designed duty, was sent across to the United States for exhibition purposes, together with the record-breaking No. 6220. The blue and silver scheme of the original trains gave place to the usual L.M.S. red with gold bands, and the general effect was very fine.

How to Beat Japan—(Continued from page 184)

an unselfsupporting island is doomed.

That, as I see it, will be the manner of Japan's downfall. Some think she can be subdued by "island hopping" through the South Seas. Others, that mass-bombing from the Chinese mainland will bring Japan to her knees. Is this conceivable in the case of any warlike race, especially of a race inured to earthquakes and tidal waves which, in a few moments, have worked greater devastation than all the bomb-raids in this war rolled into one?

No. The subjugation of Japan is essentially a great sea drama, unequalled perhaps in Naval history. In this great adventure all arms will have their part to play, on the sea, across the sea, over the sea, and under the sea. But first and last it must be a Sea Affair.

AN OUTSTANDING SHIP MODEL

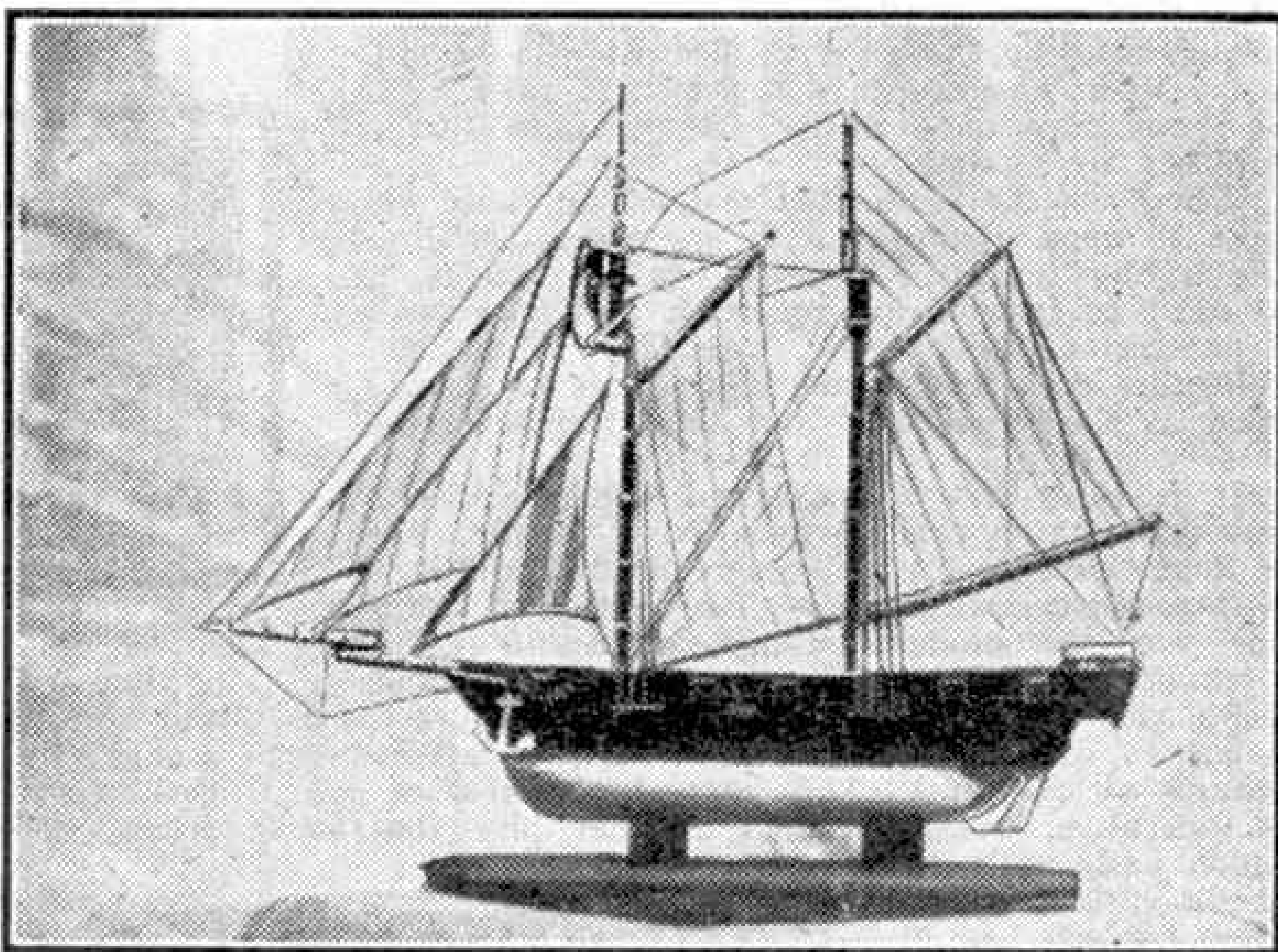
By C. R. Rowson

One of the best known ships of fiction is undoubtedly the "*Hispaniola*," which figures in R. L. Stevenson's ever popular sea tale, "*Treasure Island*." According to Stevenson, she was a 200-ton schooner, and so realistically did he write that the reader seems

to get to know every nook and cranny aboard her intimately. It is therefore not surprising to find that the "*Hispaniola*" is a popular ship with model-makers, among whom she vies for pride of place with the "*Victory*," "*Golden Hind*," and the "*Bounty*." The illustration on this page shows what is perhaps the most famous model of the ship. I photographed it last year at Swanston Cottage, near Edinburgh. The model is the work of a present-day officer of the Merchant Navy, and is perfect in detail.

COMPETITION RESULTS**HOME**

November "Missing Rails."—1. C. E. Wrayford, Bovey Tracey; 2. M. W. Buxton, Shipley; 3. J. Hobbs, Exeter. Consolation Prizes: H. A. Sanderson, Doncaster; J. B. Sanders, Erdington; D. P. Greengrass, Rossington.



A fine model of the "*Hispaniola*," the ship in which Jim Hawkins, Long John Silver and others sailed in search of fortune in R. L. Stevenson's famous story "*Treasure Island*."

December "Advertisement Letter Square" Contest.

There was an unusually large entry in this competition, and a very high standard was reached by most of the entries. So many were correct indeed that the judges finally based their decisions on the character of the entries, some of which were outstanding in novelty of presentation. The names of the advertisers or advertised products represented were: Selo, Harbutt's, Lang, Rush, Wilson, Miller, Astra, Houston, Electradix, I.C.S., Cox, Hamley's, Azol, Meccano, Hornby, B.S.A., Bond's, Hobbies, Martin, Triang and Webley.

1. J. Mann, Otley; 2. B. T. Gillyatt, Chesterfield; 3. K. N. Coppack, Hoole, Chester. Consolation Prizes: D. J. Keyes, Derby; C. H. Sykes, Rotherham; T. D. Tasker, Doncaster; C. Young, Bedford.

January "Cover Voting" Contest.—The March cover, showing a streamlined American train, was easily the most popular of 1943, judging by readers' votes in this contest. The covers for April, November, January and August came next, with little to choose between them, followed by those for September, December, May, June, July, February and October in that order. The prize-winners were as follows:

1. Daphne G. Alden, Norwich; 2. P. Richards, Dumfries; 3. B. J. Rossiter, Bristol. Consolation Prizes: C. Hilton; J. Berry, Bristol; D. Perray, Leeds 11; L. Rodwell, Tring.

January "Photographic" Contest.—1st Prizes, Section A: F. G. Reynolds, Sidcup; Section B: H. W. Jones, Cardiff. 2nd Prizes, Section A: A.C.I. R. Atkins, Eccles; Section B: T. Phipps, Cheltenham. Consolation Prizes: A. W. Bull, Beeston, Notts.; T. Bird, Luton; G. Neiley, London S.E.1.

Competitions! Open To All Readers

Solve These Simple Code-words

- | | | |
|--------------------------------|------------------------------------|-----------------------------------|
| 1. Famous Cruiser
012345 | 2. L.M.S. Locomotive
0123456789 | 3. Fine Aeroplane
012345678 |
| 4. British Station
01234567 | 5. Decisive Battle
01234567 | 6. Leading Statesman
012345678 |
| 7. Great Admiral
012345 | 8. Well-known Motor Car
012345 | |

CLUES

- | | | |
|--|--|---|
| 1. 3524 Seen in forests
014 British river | 2. 210 Fabulous bird
456789 Country
436 Negative | 3. 34567 Class
8126 Rave
3012 Tribe |
| 4. 0675 Animal covering
4123 Scold | 5. 013 Head gear
24567 Chants | 6. 0134 Flower
5276 Animal
814 Part of body |
| 7. 2451 Single
340 Relative | 8. 2143 Fit
305 Make brown | |

In the panel on this page are strings of numbers ranging from 0 to 9, each of which represents the name of some famous man or well-known object, as indicated. This forms one set of clues to the code-words puzzle that we are setting readers this month. Other clues are given under the numbers, where words made from the letters of each name are given in their code numbers, with an indication of their meaning.

To help readers we explain how to set about the puzzle, with No. 1 as an example. The name of the famous cruiser indicated contains six letters. There are two word clues, 3524, seen in forests, which clearly

is tree, and 014, British river, which is Exe. Putting in the letters in the order indicated by their numbers we arrive at the name "Exeter" for the cruiser.

Now go ahead with the remaining seven puzzles in this competition. Prizes of 21/-, 10/6 and 5/- will be awarded to the senders of the four best solutions in order of merit, and there will be consolation prizes in addition. Neatness and novelty will be taken into account if necessary.

Entries should be addressed to "June Code-Words, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 31st July; Overseas Section, 31st January, 1945.

An Easy Railway "Quiz"

For our railway competition this month we have a "Quiz." All the questions are straightforward, and those who are not able to give the answers at once should have little difficulty in discovering them from the usual sources. In preparing their entries, which should consist of numbered lists of replies, readers should remember that the judges will take novelty and neatness into consideration if this is necessary. Every reader of the "M.M." can enter this contest. Here are the questions in this interesting quiz.

1. What is a "Tommy Dodd?"
2. What is the significance of a tail lamp?
3. Which British railway company first built a "Pacific" locomotive?
4. What is a slip coach?
5. Which S.R. locomotives are nicknamed "Flannel Jackets?"
6. Why do signal posts have capped "finials?"
7. What are facing points?
8. What is the longest tunnel in Great Britain?
9. What is a clerestory roof?
10. What do the initials T.P.O. stand for?
11. What is a transition curve?
12. What British train in recent years visited the United States, and subsequently stayed there?

For the best lists of replies cash prizes of 21/-, 10/6 and 5/- are offered in Home and Overseas Sections. Entries should be addressed "June Railway Quiz, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 31st July; Overseas Section, 31st January, 1945.

June Photographic Contest

This month's contest is the 6th in our 1944 series, and in it, as usual, prizes are offered for the best photographs of any kind submitted. There are two conditions: 1, that the photographs must have been taken by the competitor; and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired, but entries on which the conditions stated above are not observed will be disqualified.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16, and all entries must be clearly marked with the section letter. They should be addressed: "June Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13." There will be separate sections for Overseas readers, and in each prizes of 15/- and 7/6 will be awarded. Closing dates: Home section, 30th June; Overseas Section, 30th December.

Fireside Fun

Small Boy: "Packet o' cigarettes, please."
Tobacconist: "Go away, boy. You're too young."
Small Boy: "What a war! Too young for cigs and too old for oranges."

Policeman: "What are you boys doing here?"
Bright Lad: "Nothing."
Policeman: "Oh, indeed, and what's that?"
Bright Lad: "It's what you can't see when you shut your eyes tight in the dark."



"Come along, Herbert, and have this nice spoonful of jam."

"I don't want it. It has a depth charge in it."

Vicar: "Do you say your prayers every night when you go to bed?"

Tommy: "Nearly. Mother says them for me sometimes."

Vicar: "And what does she say?"

Tommy: "She just says thank heaven, he's in bed for another night."

"What is a little Eskimo with a frozen finger?"

"I don't know. Tell me."

"A frigid midget with a rigid digit."

THIS MONTH'S HOWLER

Moths never grow big because they only eat holes.



"Will Mummy be long now, Dad?"

"I don't think so. They're just taking the last hat out of the window."

BRAIN TEASERS.

MOTOR CARS TO SUIT

What make of motor car should the following buy: a judge, a climber, a gunner, a dancer, a pirate, an opera star, a zoo keeper, the owner of a large estate? For every one of these there is a make of car with a name that should at once be associated with him or her.

NO WAY TO GET RICH

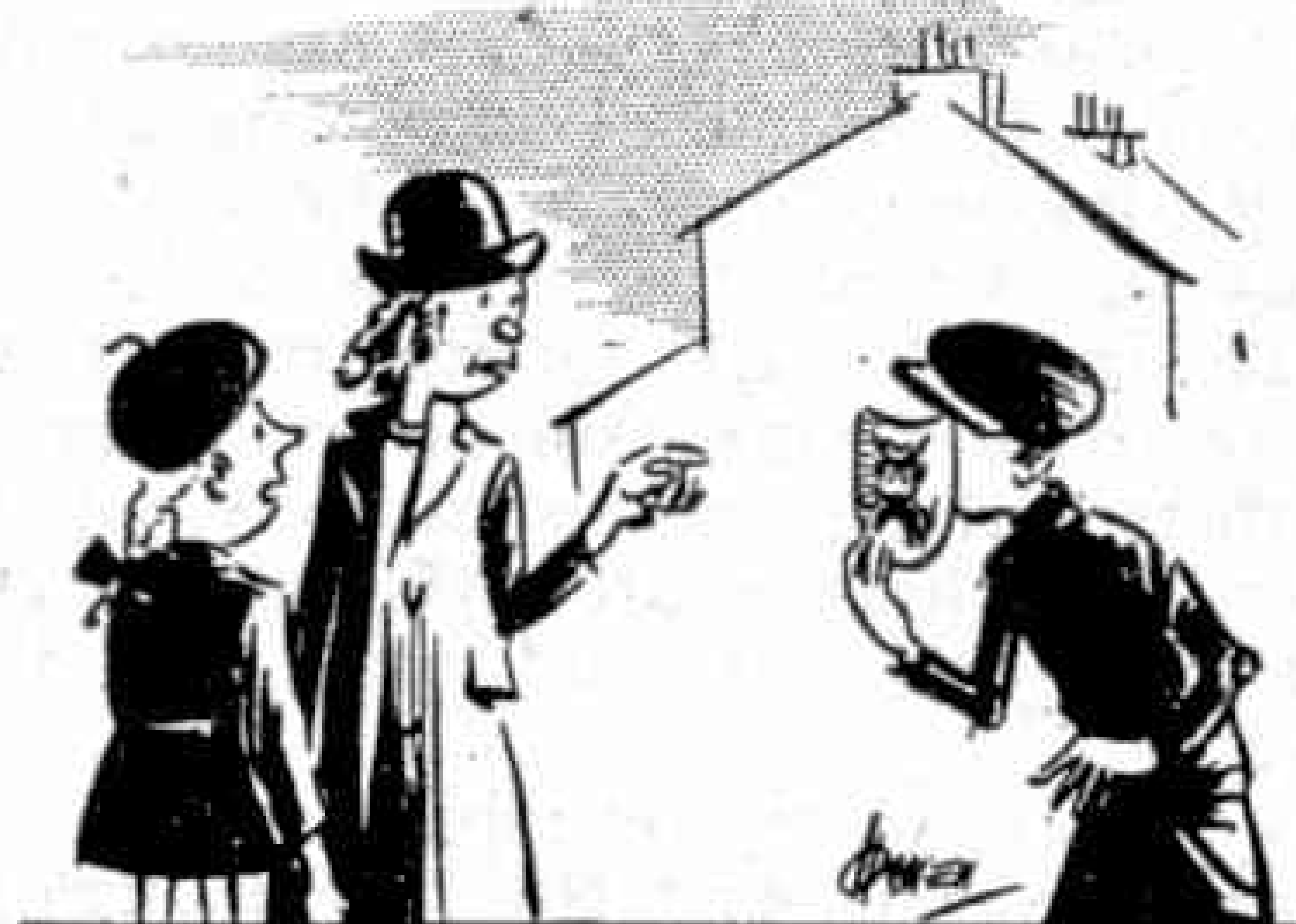
A farmer sent his six sons to market with apples to sell. The eldest had 10, the next had 20 and so on, the sixth having 60. They were told to sell their apples at the same rate, and they did so. Each returned with the same amount of money. What was the rate at which they sold the apples? A little crazy, you will agree, when you have solved the problem. G.F.

CAN YOU WORK THIS OUT?

In two years time Johnny will be four times as old as he was a year ago. How many times older will he be in nine years than he was two years ago?

FIND THE BIGGEST WORD

Look for it on this page, but instead of finding the one with most letters, find the one that adds up to the largest total when numbers are substituted for the letters, putting a down as 1, b as 2, c as 3, and so on down to z as 26.



"Your own face frightens us a lot more, Tommy Opkins."

SOLUTIONS TO LAST MONTH'S PUZZLES

A lump of sugar will remain dry when dropped into a cup of tea, provided that the tea has not been wetted! In other words, the cup of tea in our first puzzle means literally a cup of tea straight from the packet. Making the ring fall in the second part is done by concentrating the rays of the Sun on the thread by means of a good magnifying glass.

The lady in our second puzzle buys 14 yards of material at $\frac{3}{4}$ a yard and 10 yards at $\frac{4}{8}$ a yard. This problem would be easy to those who can manipulate x's and y's. Those who cannot should have noted that the number of pence in the total spent must be divisible by both 40 and 56. The number that satisfies this condition, and at the same time gives a total sum about equal to 24 times the average cost, is 1,120, which in pence represents a sum of $\frac{1120}{100} = 11.2$. Thus each material costs $\frac{11.2}{14} = \frac{8}{10} = \frac{4}{5}$.

The football report should have read: "The ball was kicked off, intercepted by the opposing inside right, passed out to the right wing, placed to the inside forward, pushed out towards the corner flag, centred and headed over the bar."

In our fourth puzzle algebra experts would soon find that there were 720 men, in 30 rows of 24 men each. In puzzles of this kind the number sought usually is divisible by many, or at any rate several, smaller numbers, and it is a good idea to try out such numbers as 180, 360 and 720.

A Correction: Last month's answer to the April Big Ben puzzle was wrong. The two hands together weigh $2\frac{1}{2}$ tons, and the total weight is 9 tons.

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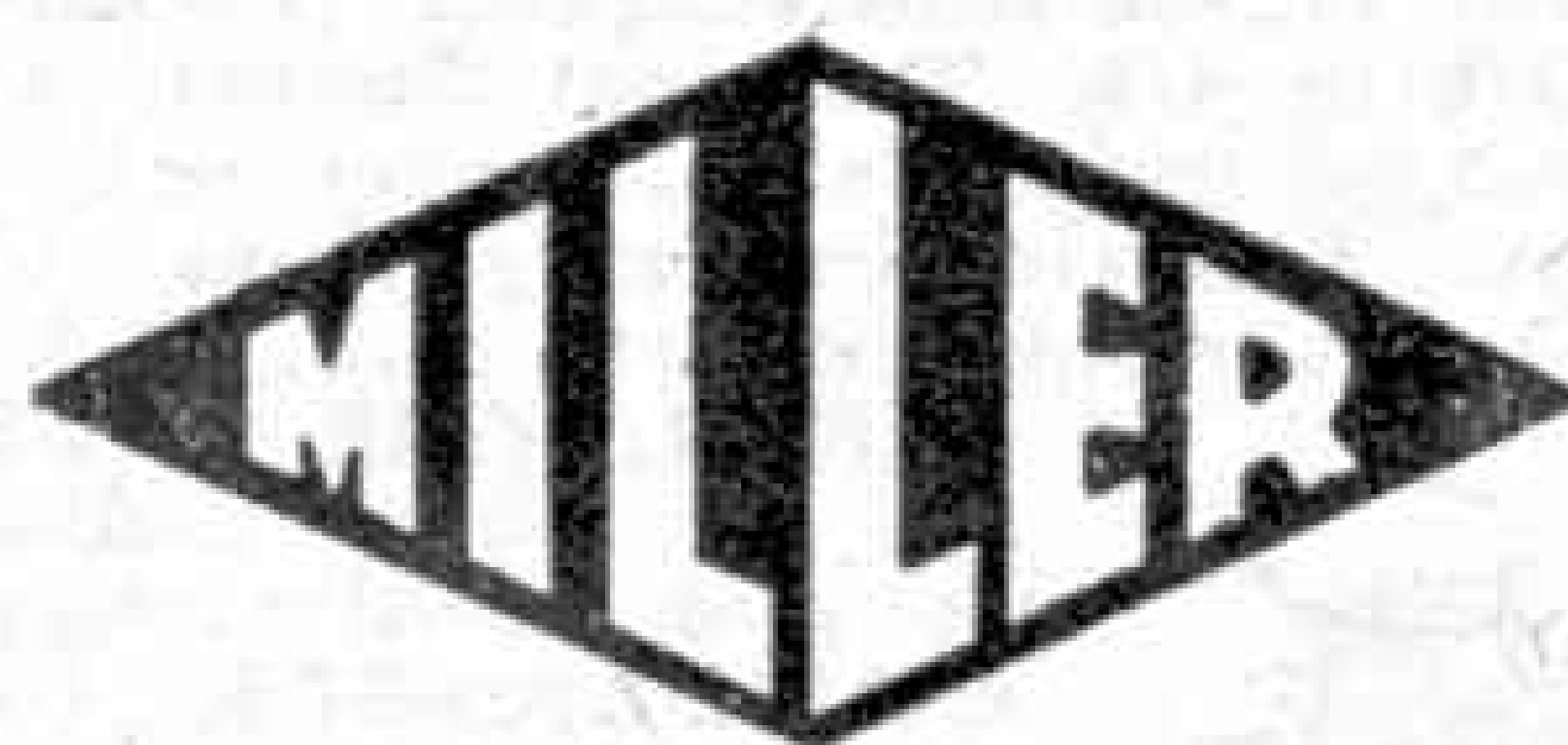


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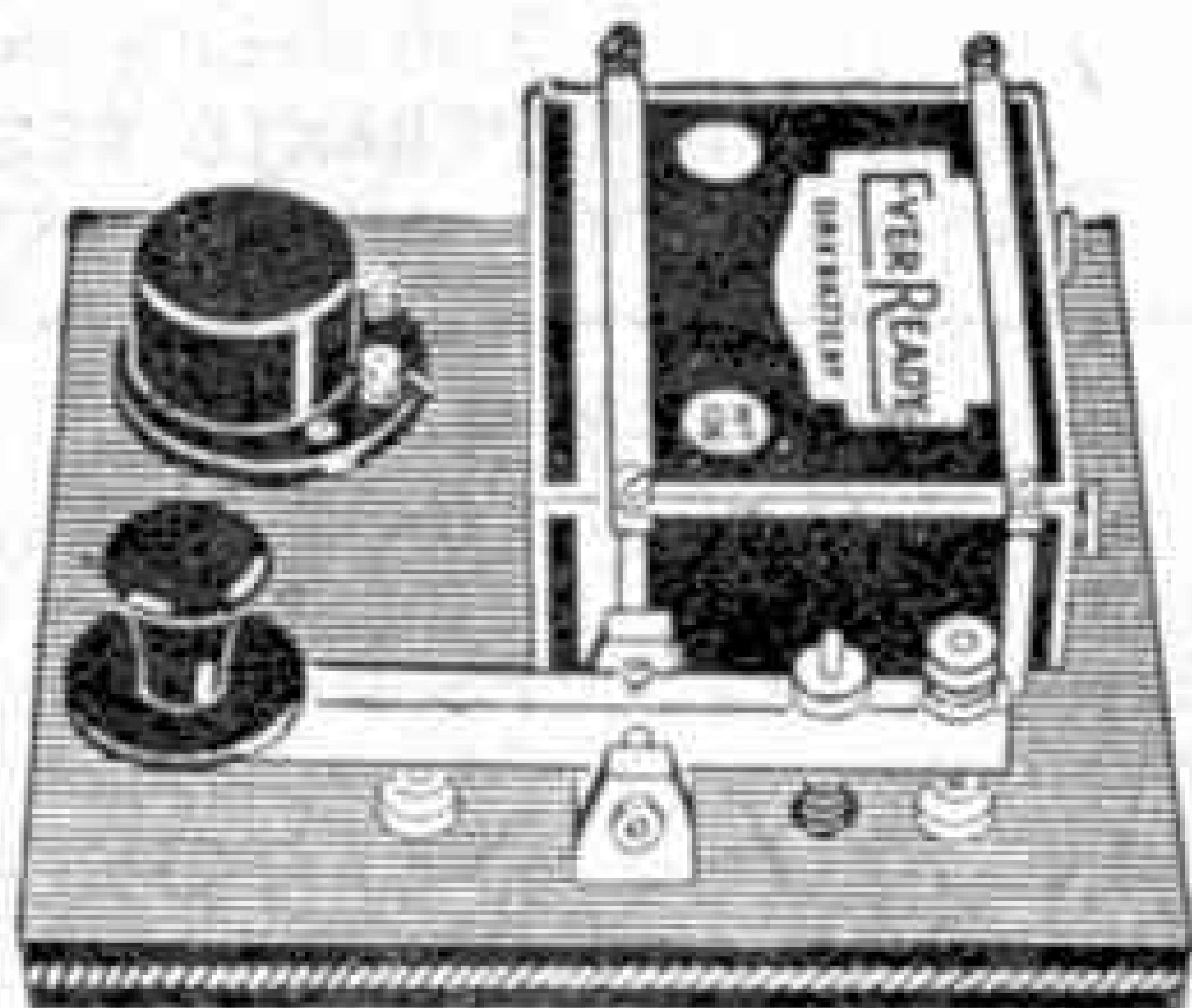


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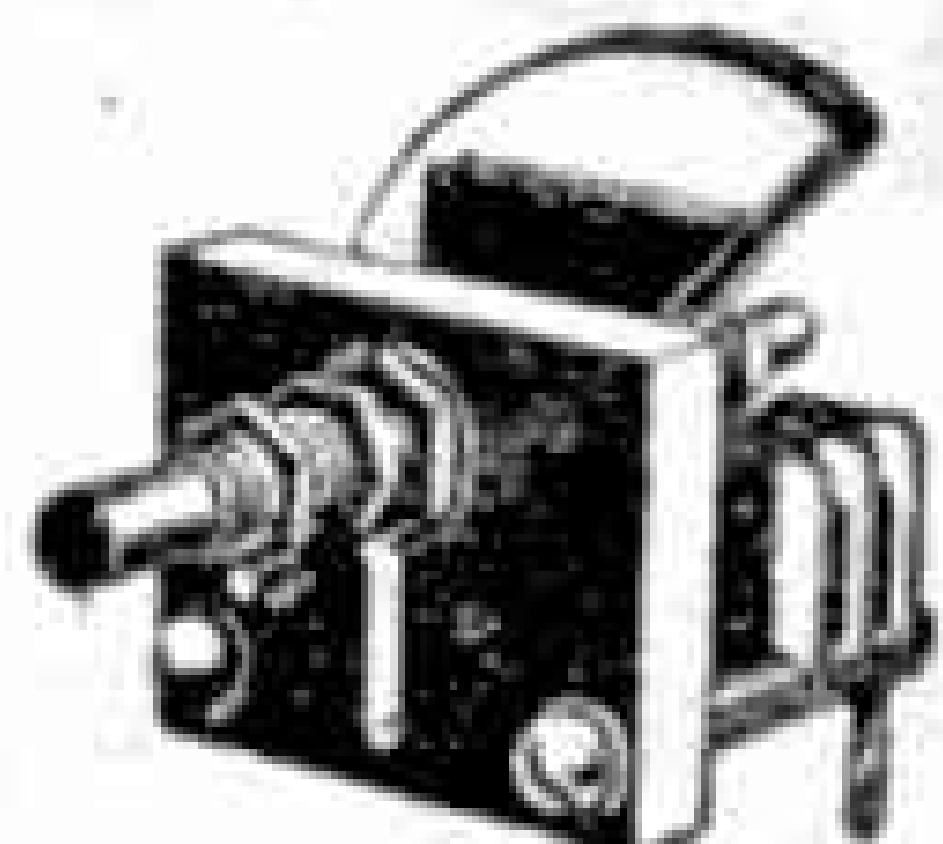


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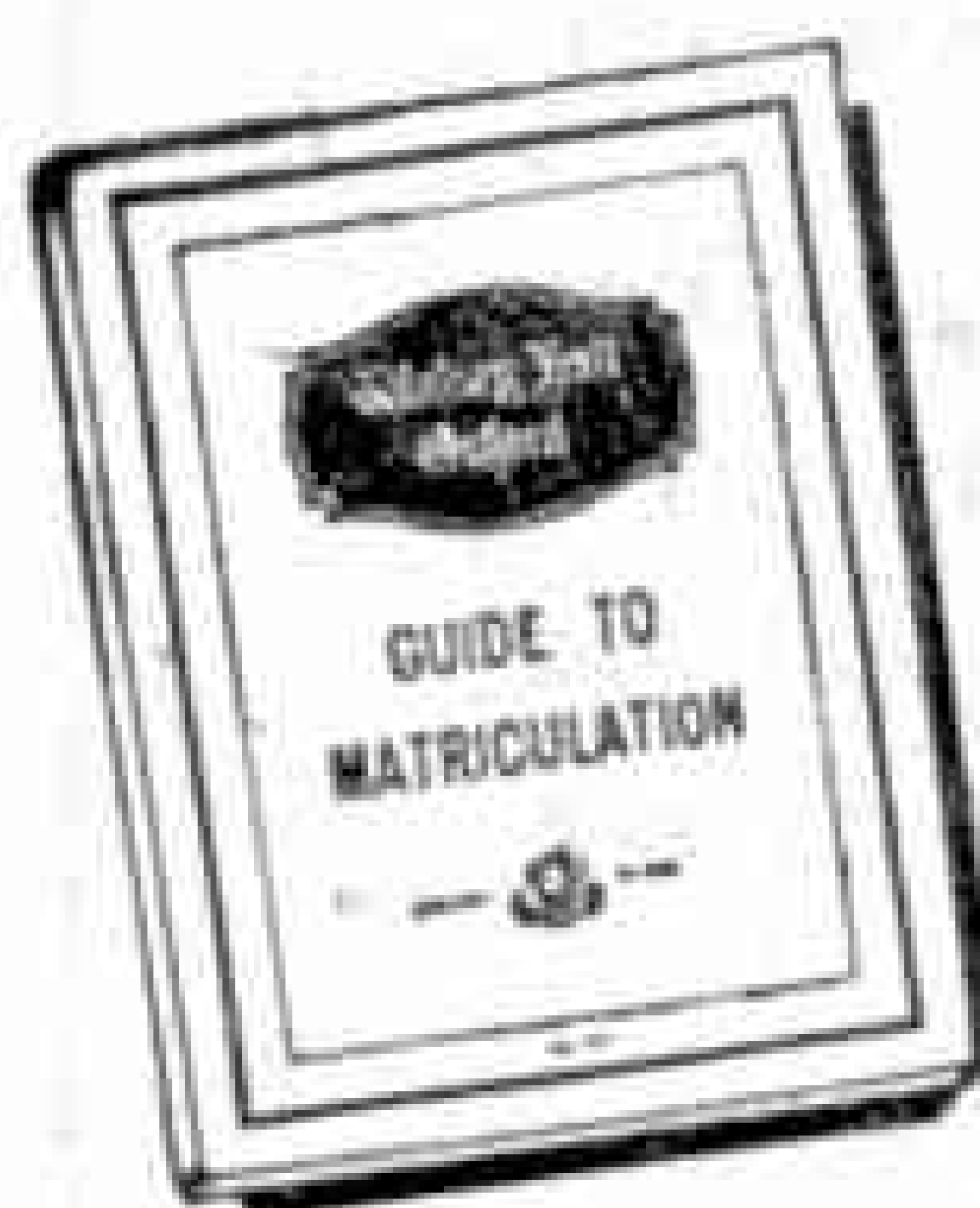
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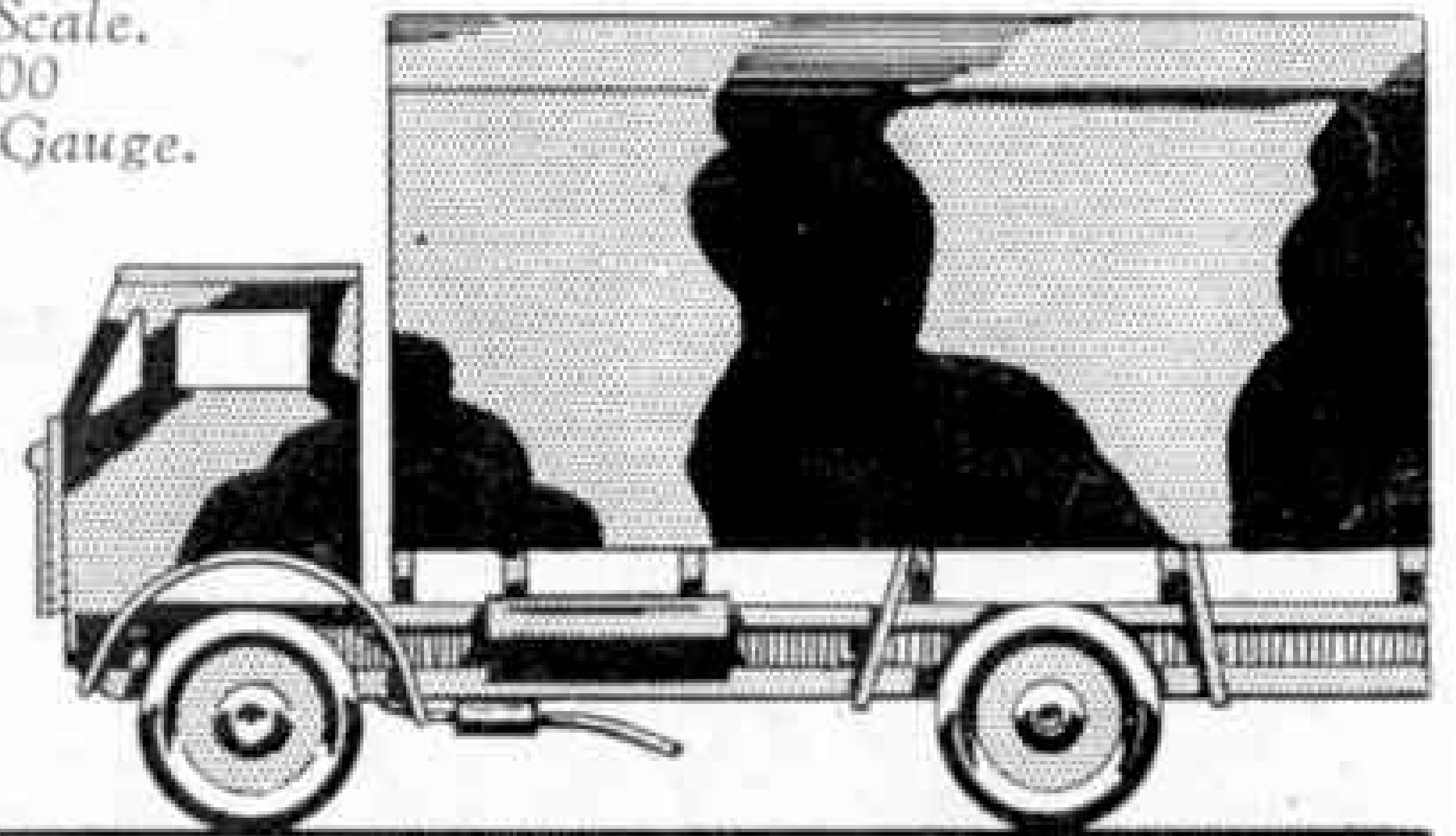
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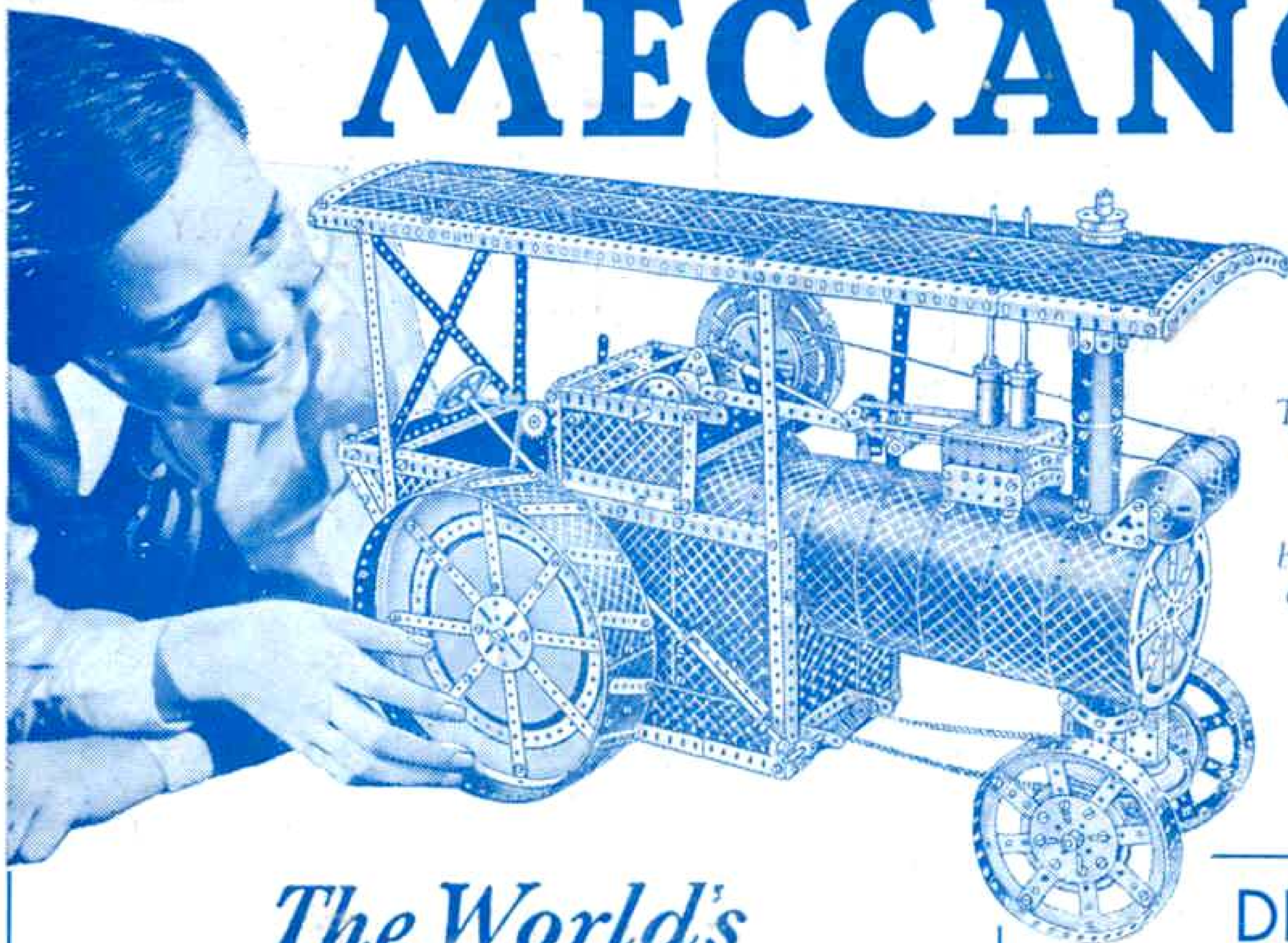
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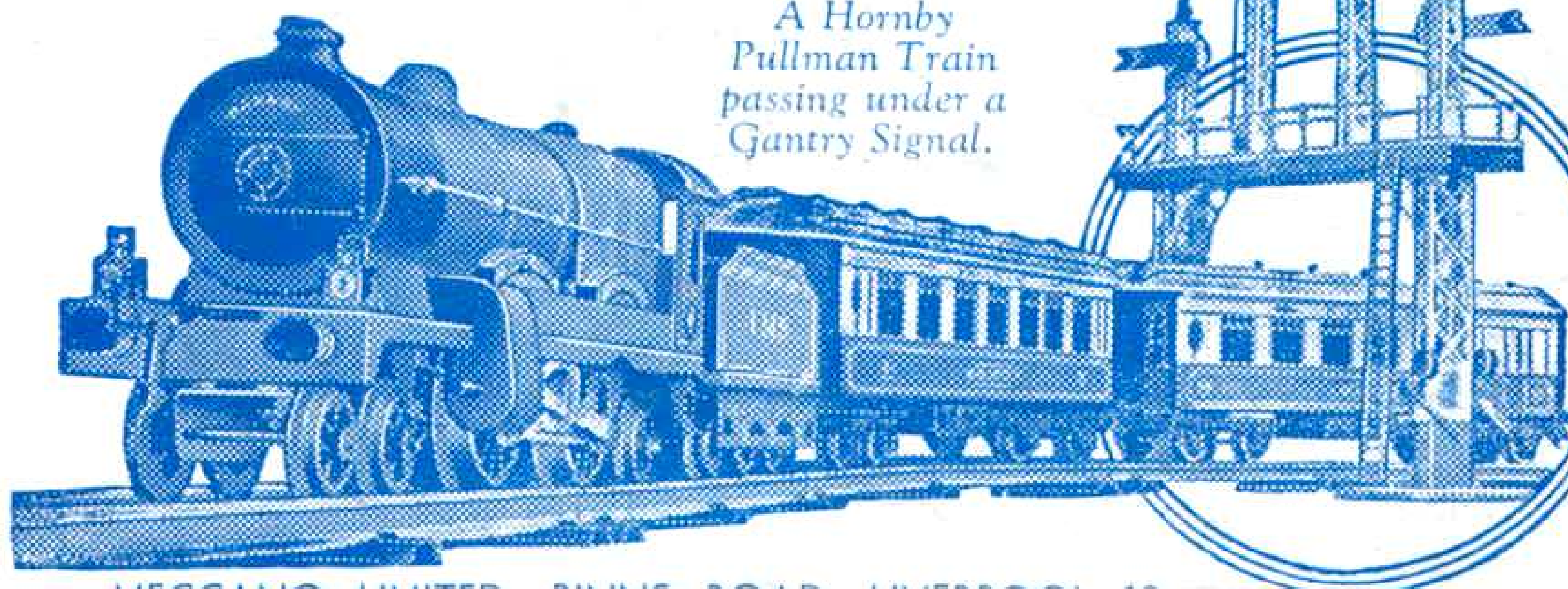


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A Hornby Pullman Train passing under a Gantry Signal.

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De Havilland "Flamingo."
Used by R.A.F. for transport and communication work.



Buick "Viceroy" Saloon Car.

MECCANO LIMITED, BINNS ROAD, LIVERPOOL 13